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PART I.

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THE PHILOLOGICAL SECRETARY.

"It will flourish, if naturalists, chemists, antiquaries, philologists, and men of science in different parts of Asia, will commit their observations to writing, and send them to the Asiatic Society at Calcutta. It will languish, if such communications shall be long intermitted: and it will die away, if they shall entirely cease."

SIR WM. JONES.

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JOURNAL OF THE ASIATIC SOCIETY.

PART I.—HISTORY, LITERATURE, &c.

No. I.—1866.

Outlines of a Plea for the Arabic Element in Official Hindustani.—By
J. BEAMES, Esq., C. S.

[Received 17th April, 1865.]

It is the fashion at present to lavish a good deal of abuse on the language generally employed in our law courts in this country.

This unfortunate variety of human speech is condemned as barbarous, a medley of heterogeneous elements, a pedantic, clumsy, unintelligible jargon, and the rest. After seven years' daily experience and use of it, I venture to take up the cudgels in its behalf. I consider it as the most progressive and civilized form of the great and widespread "language of the horde." Not only is it compendious, eloquent, expressive and copious, but it is the only form in which the legitimate development of the speech of the Gangetic tribes could show itself. Those who condemn it, in a spirit of short-sighted pedantry and affectation, must, if they are prepared to abide by the logical consequences of their opinion, condemn also those languages of modern Europe, which, by virtue of following the same course as the Urdû, have succeeded in overstepping the narrow limits of their birth-places, and becoming the common property of half the world. To object to the free use in Hindustani of words derived from Arabic and Persian, is as absurd as to object to the free use of Latin and Greek derivatives in English. As a merchant, by skilful trading with borrowed capital,

may become a *millionaire*, so English by readily borrowing and making good use of its borrowed stores, has raised itself from an obscure low German patois to the most extensively used medium of communication between distant countries.

I. The parallel between English with its Teutonic and Latin elements, and *Urdú* with its Sanskrit and Semitic components, is no newly discovered thing. It has been used again and again, with more or less learning, to help us to deplore the iniquities of our *omla* and *mukhtárs*.

The comparison, however, cuts both ways. It may perhaps help us to find something to admire in the phraseology of a *rubakári* or the cunningly woven sentences of a pleading.

First then, of English. English is a dialect, as every one knows, of Plate-Deutsch, allied to the Hoch-Deutsch, the tongue of Goethe and Schiller, by the ties of a common descent from the early Gothic, the sister of Sanskrit. It has been brought into contact with many other forms of speech, some closely, others remotely, akin to it. Celtic of Scotland and Wales; Scandinavian of Norway and Denmark; Latin; Norman French, a blending of the two last named; early French, the Frankish struggling still against the Latin element; Latin again, barbarized by monks and lawyers; French again, from the wars of the Henries and Edwards; Spanish, from the Elizabethan wars, bringing with it a substratum of Moorish Arabic; French again, of Racine and Moliere in the days of the degraded Stuart kings, from the court of the "Grand Monarque;" Dutch with William of "glorious, pious and immortal memory;" finally a sprinkling of Turkish, Persian and Russian from our travellers, and many words from Latin which crept in in a roundabout way from time to time through our neighbours the French and Italians.

All these elements skilfully worked up, patiently pieced together, carefully incorporated into the solid English groundwork, have composed the bright, varied and harmonious mosaic of our modern mother-tongue.

There were doubtless pedants and grumblers ready to find fault at each stage of growth in English. The Saxon clod of the time of the Conqueror objected to the terms 'beef,' 'veal,' 'pork,' 'mutton,' which were then supplanting his pure English 'ox,' 'calf,' 'pig' and

‘sheep.’ Chaucer’s introduction of French words into his poems won for him the ridicule of his contemporaries. But in spite of ridicule and learned objectors, the language assimilated these foreign words and profited by the process.

The German on the other hand has absorbed very little of the Latin or other foreign elements.

It has endeavoured to meet the wants of civilization and progress by combinations of indigenous words, rather than by borrowing. In other words it has done what our purists wish the Hindustani to do. The result is known to every one. Great as are the expressiveness and power of composition of the German language, its usefulness as a practical, working, every-day speech is far below that of English or any other European language. We have only, for instance, to compare a few German words with their English equivalents to see where lies the flexibility, expression, and delicacy of sentiment.

“*Gefangenschaft*” (literally ‘catch-hold-ship’) would scarcely be felt as an advantageous change for ‘custody.’ Use might reconcile us to “*Begripship*,” but ‘custody’ means more than mere holding fast.

Vergnuegsam (‘For-enough-some’) is but a barbarous substitute for ‘contented,’ which latter gives us the idea of being contained and secure in certain limits;—while the former is a barren enunciation of merely having enough. Not to mention the unpleasantly harsh collision of consonants.

Verurtheilung, sentence. Here the English word is far the more manageable than the clumsy circumlocution of “fore-out-telling” or “parting.”

Vervollkommen. “To complete” is again better than “To fore-full-come.”

Wiederaufleben, revival, “das wiederaufleben der Gelehrsamkeit (the again-up-living of be-lore-some-hood) is rather a roundabout substitute for the neat and concise English, “the revival of learning.”

Wiederherstellungsmittel. Here is a nice morsel for throat and teeth. It looks very alarming, but only means “a restorative,” and the English word gives the meaning quite as fully as the monstrous German compound. *Wieder* = re; *herstellung* = stor (stauz) ’s; *mittel* = ative.

Zusammenberufen, to convoke.

Zurückziehen, to retract, withdraw; "withdraw" is formed from our own Teutonic stores.

The fact is that in making compound words, the English has the advantage of using the short and expressive Latin prefixes, *pro*, *re*, *con*, *per*, *in*; whereas the German, rejecting these commodious foreigners, has to fall back on the unwieldy natives; *Wieder*, *zusammen*, *zurück*, *wider*, *heraus*, &c. The result is that its compounds are of uncomfortable length, and are rather circumlocutions than direct expressions of the idea involved.

Turning now to Hindustani for Teutonic, let us put Indian as expressing the class of languages from which the old Hindi Bhashas are derived and for Latin or Romance let us put Semitic. Then the proposition I would maintain stands thus: The Hindustani language meets the requirements of civilization better by borrowing freely from Semitic sources than by forming words and compounds from Indian sources.

To borrow a metaphor from Botany, the Semitic languages are endogenous, the Indo-Germanic exogenous. The former grow by additions from within, the latter by accretions from without.

Accretions, it is evident, are limited solely by their power of adhering to the original trunk. Or perhaps it would be better to say accretions may be multiplied up to the sustaining limit of the parent stem.

Endogenous growth on the other hand is limited by the space it can squeeze out for itself in the *enciente* of the older formations. With a strong parent stem like German or Sanskrit, accretive compounds may be formed almost without limit. Sanskrit thinks nothing of a twenty-syllabled compound, and a word like 'herausbekommen' is as nothing to German organs. In Arabic, and Hebrew, on the contrary there is the triliteral root, which may be made to evolve many dozens of new words, but all within the limits of the three radical letters aided by a handful of serviles. The result is that the Semitic languages can express more in a small compass than the Indo-Germanic can. A prefixed *alif* or *mim* will often have as much power as 'con' 'pro' 're' or half a dozen Latin or Greek words strung together; thus from *nazara* to see, the simple lengthening of a vowel gives us "nâzir," a word, the technical and ordinary meaning of which, cannot be expressed in any Indo-Germanic language without a compound. *e. g.*

1. Sanskrit, *Adhyaksha*.
Upadrishtá.
Adhikári.
Avekshitá, all compounded with a preposition.
2. Greek, *Epistatés*.
3. Latin, *Inspector*.
4. German, *Aufseher*, *Inspektor*.
5. English, *Overseer*, *Inspector*.

Illustrations may be multiplied by any one who possesses a few dictionaries. To be able to express ideas of a complex nature by short and simple words is an undeniable advantage. When a language has two or more sources from which it can draw, native sources giving it only long cumbrous compounds, foreign ones giving it neat and convenient uncompounded words, it is only natural that the latter should be chosen. The Bengali, like the German, has chosen to trust to its Indian resources; and the result is a collection of 'sesquipedalia verba' of the most alarming description, and what is more to the purpose in these practical days, it is yielding visibly to the more progressive Hindustani.

On the score of convenience then I defend the present court language. If we look at the historical question again, we find good reason for the use of foreign words. Hindi is in its origin Sanskrit, with a substratum of Turanian elements, the extent and exact direction of whose influence has never been fully worked out. I believe it to be much greater than is usually supposed. The language thus constituted, was brought into contact with fresh Turanian influences through the Mogul invasions. In the same manner Persian, Pushtoo and Arabic were brought to bear on it. The point of contact was western Hindustan and the Punjab, but gradually the foreign influence penetrated the whole country. It must be remembered also, that along with an influx of foreign languages came an entire change in the civil and religious organization of the country. Whole provinces were converted to a religion whose most sacred duties can be expressed only in Arabic. Offices were created on the model of those in Cabul and Persia. Systems were introduced which had long flourished in Central Asia among the Mantchus and the Kirghis.

Hence a large importation of foreign words in religion, government,

arms and art, which ended in the establishment of the Urdú or camp language, a language destined advisedly for the palace, the court, the camp, the market. Its father the Hindi, its mother the Arabic, it borrows freely from both its parents.

Up to this point most men will agree with me that the free use of Arabic and Persian is defensible both on the grounds of the origin of the language as well as of convenience.

The two great accusations brought against the language, however, are ; first, that the Arabic and Persian words are used in an incorrect, garbled and distorted way, and secondly, that the language itself is unintelligible to the mass of the people. I proceed to discuss these objections a little more in detail.

II. First, then it is asserted that the use of Arabic and Persian words in the way they are employed by native officials is mere pedantry ; that the words are used in wrong senses and often utterly misapplied, that participles are used as nouns, nouns as verbs and so on.

Now this may mean either that munshi Arabic is incorrect according to the rules of grammar of the times of the Kurán ; or that it is wrong according to the usages of the modern colloquial and written Arabic.—If the former of these two theories is advanced, I meet it by a simple and positive denial of its truth. A few examples may be taken as tests.

Ashkhás. The Arabic *shakhs*, of which this is the legitimate and regular plural, means, literally separation, or the distinguishing of one thing from another ; or more strictly, the act or condition of being separate and distinct. *Shakhs* is therefore the exact equivalent of the English word “individual,” a word which is good modern English enough ; and *ashkhás*, signifying the persons or individuals concerned in a lawsuit, is therefore a more accurate word than the Hindi *log* ; which really means, “the world,” or the collected body of human beings, and is quite out of place in designating a special class or number of people.

Mudda'i, from *da'a*, he called.

(Freytag—vocavit, advocavit, provocavit,) is the regularly formed active participle of the 8th conjugation, and literally and exactly means a claimant or prosecutor ; “Arrogans vel sili vindicans rem contra aliquem ;” and is therefore a more expressive word than “bádi,”

which simply means a speaker ; or “*firiyádí*” which, besides being a foreign word, means literally one who cries out, a weeper, lamenter ; which a plaintiff often is not.

Mudda’á ‘alayhi, literally “the complained against him,” or “he who is complained against ;” being the passive participle of *mudda’i*, with the preposition and pronominal affix *‘alayhi*. *Pratibádí*, “he who speaks back again” is far less comprehensive.

Hasbu’ttafsilí’l’zayli, “according to the specification below” is good and grammatical Arabic, and in its Persianized form “*hasb-i tafsíl zayl*” gives a neat and convenient official formula for the roundabout Hindi “*jaisá ki nichhe likhá huá hai*,” which cannot be formed into a compound adjective or otherwise manipulated.

Inkizá, “completion,” is the regular verbal noun of the seventh conjugation of the verb *kazáya* the original meaning of which, as I have elsewhere shewn, is “cutting off, finishing, defining, decreeing,” the word is used frequently in pure Arabic in the same sense.

Ba’d inkizá-i mohlat, “after the expiry of the term,” is correct enough, and almost incapable of being tersely expressed in Hindi without recourse to some half obsolete word of Sanskrit origin.

Bi muktazá ; according to ; in the phrase, “*bi muktazá rái ‘adálat*,” “according to the opinion of the court,” the root *kazáya* in the eighth conjugation, has the sense of deciding. The expression *bi muktaza* is used in Arabic authors as the equivalent of “*secundum*” “*ad.*” I should be glad if some of our critics would express this phrase in modern Hindi in terms equally neat, and as generally intelligible.

Inkisháf ; *istiswáb* ; *intizám* ; *ikbál* ; are further instances of words which may be found in Arabic and Persian classics in the same sense as they bear in Hindustani. It is useless to multiply instances, were I to give half of the words used correctly by our Munshís I should have to write a volume, not an essay.

To turn next to words which are used by Hindustani writers in a sense different from their classical usage, also words which are not found at all in the classics ; we find them tolerably numerous, and they form in fact the chief stumbling-blocks to the purists. The word “*istimzāj*” for instance is not found in good Arabic or in those Persian authors who use Arabic words. The root ‘*mazaja*’ means *he mixed*, and the noun “*mizāj*” implies ‘mixture’ and is used for that mixture

of feelings and passions which constitutes the temperament of a human being; in other words, his 'disposition.' *Istishzāj* is used by our Hindustani writers to signify, "wishing to know what the sentiments of a person (*mizāj*) are on a certain point," i. e., asking for permission. In other words, the noun *mizāj* is taken as the root from which a sort of denominative verb in the tenth conjugation is formed *istamzāja*, and from this again a regular verbal noun *istimzāj* is formed. Now I admit that such a process is not found to exist in Arabic with regard to this verb, but such a process is found with regard to other words; and we do not know enough of the state of the various dialects of Arabic in the thirteenth century to be able to affirm that such a word may not have been used in some of them; and that it may not have been brought into India by some of the "mixed multitude," who accompanied the earlier Musalmán invaders. We have no right to suppose that those writers who, three or four centuries ago, created the Urdú tongue, borrowed their Arabic solely from the classical dialect of the Kuran. So far was the Kuran from being written in the ordinary colloquial style, that we know Muhammad himself was in the habit of pointing to it as one of his greatest miracles, and that the unapproachable purity of its diction is to the present day a subject of admiration to all the faithful. The *conversazione* of Hariri again, from which so many of our European scholars draw their ideas of Arabic, is a professedly pedantic work, and it is never pretended that the ordinary Arab of the period talked in such elaborate strains. We must seek for the origin of many of our modern Indo-Arabic words in the language of the lower class of which, to this day, we know next to nothing. That the language of the towns, even in Muhammad's time, had lost much of its early purity is shewn, *inter alia*, by the customs of the townsmen of sending their children into the desert to learn from the mouths of the Badawin the unadulterated tongue. The prophet himself is said, in this way, to have spent some years among the tribe of Saad a branch of the Kuraysh.

After the death of Muhammad the decay of the spoken language was very rapid. One of the latest and best authorities on this subject says; "Every language without a written literature tends to decay more than to development by reason of foreign influences; and the history of the Arabic exhibits an instance of decay remarkably rapid

and extraordinary in degree. An immediate consequence of the foreign conquests achieved by the Arabs under Muhammad's first four successors, was an extensive corruption of their language: for the nations that they subdued were naturally obliged to adopt, in a great measure, the speech of the conquerors, a speech which few persons have ever acquired in such a degree as to be secure from the commission of frequent errors in grammar, without learning it from infancy. These nations, therefore, and the Arabs dwelling among them, concurred in forming a simplified dialect, chiefly by neglecting to observe those inflections and grammatical rules which constitute the greatest difficulty of the classical Arabic." (Lane's Arabic Dictionary. Preface; p. vii. London, 1863.)

The inference I draw from the above remarks is, that we have no right to compare the Arabic used in modern Hindustani with the Arabic of classical writers, and to condemn it, if it does not agree with theirs. Still less have we any right to compare it with the elaborate Arabic of the grammarians. The Indo-Arabic of the present day is the legitimate descendant of the Arabic brought into India by the early conquerors, and we may safely give them credit for having spoken their own language correctly, even though that language was not precisely the same as that spoken by Muhammad and his tribesmen. When Abu Bakr raised the standard of Islam and sent out the armies of the faithful to the conquest of Syria, warriors from Yaman and Hadramaut joined his troops. These must have spoken Himyaritic dialects, differing widely from the dialects of Mecca and Medina. Bar-Hebræus, in his Syriac "History of the dynasties," speaks of the Arabs always as "Tayoye," or men of the tribe of Tai, whose dialect differed considerably, not only in the use of words, but in grammatical forms, from the literary standard of Arabic.

Moawuja's army was composed almost entirely of Syrians; and the Arab troops which conquered Persia were largely composed of the same semi-foreign element. There is thus ample ground for supposing that the form of Arabic which the conquering troops of El Islam brought with them into Persia, and which so powerfully influenced that language, was not the form which is reproduced in the Kuran and in the classical works of western and central Arabia. Here again

I confine myself to hinting at a probable source of Indo-Arabic; to follow up these suggestions thoroughly, would require an intimate knowledge of all the forms of spoken Arabic; and would lead me too far from the present enquiry. I trust, however, that I have shewn that our Munshi Arabic should not be hastily judged by comparison with an almost foreign standard.

III. The second assertion, that the court language is unintelligible to the mass of the people, is partly true, partly false. The real fact is that the court language, being the highest and most cultivated form of Hindustani, is intelligible to the people exactly in proportion to their education. To the highly educated native it is perfectly intelligible; to the illiterate rustic it is as Coptic or Chinese. Precisely the same may be said of any language which can boast of a literature. The literary style always will be, must be, in fact, from its very nature, above the comprehension of the masses.

Put the *Times* or the *Saturday Review* into the hands of a peasant, and see how much he will understand of it. Never was there a more absurd and unreasonable demand made of any cultivated tongue, than that it should exhibit copiousness and expressiveness, and at the same time not be above the understanding of the boor. The ideas of the Indian rustic do not soar above the petty wants and homely occupations of his every-day life, except in a few instances. When they do, he uses Persian or Arabic words to express them. His own Hindi does not help him. A considerable number of simple Arabic and Persian words enters into the vocabulary of the peasant, and they are as familiar to him as they are to the educated pleader or official. Some exist side by side with words of Sanskrit origin, and have a special sub-shade of meaning attached to them. Others stand alone, having no equivalent in the Hindi.

Of the first class are such words as *wakt*, time in general; and *bela* or *vela*, a special time of the day; *tarf* and *ur* or *diq*; *makán* and *ghar*; *rasta* and *sarak*; *darwáza* and *dwár*; *kitáa* and *khet*; *ábád* *karná* and *jotna*; *zamín* and *mañfi*; *'aurat* and *randí*; *sarhad* and *siwáná*; and many others. Of the latter class, *ma'lúm*, *matlab*, *tabdíl*; *ziyáda*, (*jásti*), *ziyádati*, *roshan*, *badma'ásh*, *súrat*, *tajvíz*, *zarúr*, *tamám*, *niháyat*, *mál*, *mawáshi*, (*maweshi*), *tarah*, *wáste*, *muáfik*, *jabr*, *zabardast*, *zulm*, *zálím*, *gharíb*, *parwarish*, (*parwasti*), *jawáb*

jangál, *maidán*, *durust*, and a long list besides. Any one of these words may be heard from the mouth of the most ignorant ryot in the most secluded parts of the country, as any one who has travelled much in India knows. This large class of foreign words has almost, if not entirely, displaced the corresponding Hindi terms. If any one doubts this, let him read the following list, and judge for himself which of the two he is most familiar with in the mouths of the people—these Hindi words or their foreign equivalents :—

<i>Foreign.</i>	<i>Hindi.</i>
ma'lum.	parkásh.
matlab.	parojan.
tabdíl.	pher.
ziyada.	adhik (aur.)
roshan.	pargat.
badma'ásh.	gundá, luchá.
súrat.	rúp.
tajvíz.	(no equivalent.)
zarúr.	uchit (more common in Bengali than in Hindi.)
tamám.	sára, sab.
niháyat.	bahut.
mál.	dhap.
mawáshí.	gorú.
tarah.	prakár, (Bengali.)
wáste.	liye.
muáfik.	sá (as an affix.)
jawáb.	uttar.
jangal.	ban (very inadequate.)
maidán.	bádh.
&c.	&c.

A few of these words express adequately the meaning of the corresponding Persian word, but how many of them are known to educated people? I do not here speak of the English official, who may be expected only to know the simple surface words which meet him in his every day work; but I would ask any educated native how many Hindi words he uses in his ordinary conversation with men of his own and other classes.

As I am here only outlining a defence of my side of the question, I will pass on to another argument. Hindi is not one language. It is ten or fifteen or more different dialects. The following list, taken from a work which relates the early efforts of the Serampore missionaries to introduce the Bible in his own tongue to the home of every ryot, will shew how great the diversity is.

<i>Dialect.</i>	<i>Locality.</i>
Brijbhás'há,	Agra, Muttra.
Canojia,	Cawnpore, Futtehgurh, Etawah, Bareilly, Alligurh.
Koshala,	Oudh.
Bhojpúri,	Benares, Ghazipoor, Arrah.
Hariáni,	Hariana, Hissar, Rohtak.
Bundelkhandí,	Bundelkhund.
Boghela,	Boghelkhund, (Central India)
Harroti,	Malwah.
Oojjaínee,	Ujayin.
Oodeypooree,	Udaypúr.
Márwári,	Marwar.
Jaypuri,	Jaypur.
Bikánirí,	Bikanír.
Bhattánirí,	Bhattanir.
Magara,	Behar, Patna.
Tirhutiya or	Tirhoot, Purneah.
Maithil,	Bhaugulpoor, Monghyr.

Now, I would ask those who wish us to abjure Persian and Arabic and draw from "the well of *Hindi* undefiled," which of all these dialects is to be considered as undefiled. If to the above dialects we add Marathi, Guzaratti, Sindhi, Ooch, Punjabi, Dogra, Cashmeree, Parbutia, Moonugee, Palpa—all of which are more or less Hindi—the difficulty of selecting our standard becomes almost insurmountable; for in these various forms of Hindi not only do the vocables differ, but the very declensions and conjugations, the very root and fibre of the language. Thus for the genitive case affix, we have *ká, ke, kí*, Hindi: *dá, de, dí, diáu*, Punjabi: *cha, che, chí, chya*, Maráthi: *sa, se, si* &c. Sindhi, and so on. The verb *honá* to be, undergoes a wonderful variety of inflections. Not to multiply instances, it may suffice to say

that there is no such thing as a Hindi standard of speech which is at once intelligible to all classes, in all parts of Hindustan. For a common standard you are driven to the Urdu, which has selected and embalmed the purest and most widely used forms of the old Hindi. Just as in England, if we threw aside our classical English tongue with all its foreign importations, we should find ourselves in a chaos of Hampshire, Somerset, Yorkshire, Lowland Scotch and other jargons; so would it be in India. Who that has not lived among the people understands the following words, common though they are in the mouth of the Hampshire peasant? *to brize, to dount, fessey, to hov, kittering, mokin, rumwards, skrow, stabble, taly, wivvery, wosset, yape, to yaw.* Examples without number might be given by any one who recollects the peasant-talk of his own county in England. No one in his senses would recommend our generally adopting any of these words, good old Celtic and Saxon though they be, and yet we are asked in India to recommend and assist in a precisely similar process. The fact is that the languages of modern times have all arisen from a fusion of cognate dialects, just as most nations have been formed by coalitions of kindred tribes. By throwing aside that which was peculiar to themselves, and retaining all those words and inflections which they possessed in common, modern nations obtained a national basis of speech on which to engraft words borrowed from foreign sources; and thus were built up English, French, Italian, Spanish, Turkish, and all the leading languages of our times. That the Gangetic tribes, by a happy coincidence, have been able to follow the same course, and, by fusing the rough Hindi dialects into one, to add thereto many expressive foreign words, is a circumstance which, far from being lamentable or a sign of decay, entitles the language so formed, to rank among progressive and civilized tongues. If the rudest of the peasantry cannot understand the cultivated language of their educated compatriots, it is not therefore advisable to despoil the language of its legitimate gains, to bring it down to the level of grihasths and gwálás. Rather, let the latter be educated till they do understand. The difficulty which the peasant finds in understanding the Court language has been immensely overrated, and is only due to his imperfect education. The true remedy for the difficulty is not to be found in an insane attempt to impoverish a fine and copious language, but in making it more widely known to all classes in India.

A translation of the Chapter on Ordeals, from the Vyāvahāra Mayukha.
—By Professor GEORGE BUIHLER, *Elphinstone College, Bombay.*

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The following translation of the Mayukha's chapter on Ordeals was originally prepared by a Bombay Shāstri at the request of my learned friend, Mr. Wh. Stokes, and intended to be inserted in the reprint of Mr. Borradaile's translation of the Mayukha, which was being published under his superintendence in Madras. When I looked over the Shāstri's work, I found that it would be of no use, as his translation was frequently unintelligible, and often decidedly wrong. I therefore retranslated nearly the whole, with the assistance of Mr. Vināyak Laxman, late Hindu Law Officer of the Bombay High Court. Circumstances prevented the completion of the translation, before the printing of Mr. Borradaile's Mayukha was too far advanced to admit of its insertion.

These circumstances will explain how it happened that my attention was directed to a part of the Hindu Law, like the Ordeals, which has a purely antiquarian interest, and has become rather trite by the publication of two papers on it; one by Ali Ibrāhim Khan, As. Res. I., p. 389, the other by Prof. Stenzler, Journ. D. Morg. Ges. Vol. IX., as well as by the appearance of a translation of the chapter on Ordeals from the Mitāksharā by Mr. W. Macnaghten, (Principles and Prec. of H. Law, Madras, 1865.)

Here (begin) the ordeals :

They are used to decide matters which are left undecided by human evidence. They are of two kinds (1st) such, as decide (a case) immediately, and (2nd) such, as decide it after the lapse of some time.

Amongst them Brihaspati describes those of the first kind (in the following verse) :

“The scales, fire, and water, poison, fifthly consecrated water; rice grains are declared to be the sixth; hot māsha (coins) the seventh; the eighth is the ploughshare, according to the (ancient sages); the lot is recorded as the ninth.”

Yājñavalkya declares (II. 95) that the first five (of these nine ordeals) (are to be used) in (cases involving) heavy accusations only.

“The scales, fire, water, poison and consecrated water are the ordeals (used) here (in lawsuits) for exculpation, if the plaintiff binds himself to abide by the award (*Çirshakastha* means ready,) and to suffer the punishment, which the defendant would suffer in case of defeat.

Pitâmaha (says):

“Let him (the judge) order the scales, etc. for those, against whom the accusation is urged with great confidence; rice grains and consecrated water he should order in doubtful cases.”

Avashṭambha (means) confidence.

According to this passage (of Pitâmaha) consecrated water may be used when the plaintiff is full of confidence, (as well as when he is) doubtful.

In the *Kâlikâpurâṇa* (we read):

“In case of an accusation of adultery, of theft, of a connexion with women (the intercourse with whom is) forbidden, or of a *Mahâpâtaka* or of high treason, let an ordeal take place.

“When there is conflicting evidence or (any other) dispute, or if a blame is attached to the plaintiff, then shall the king order the ordeal (to take place) after the plaintiff has declared himself ready to suffer the punishment (of defeat). When there are many witnesses in an action for adultery, let the defendant undergo the ordeal, in order to clear himself without any additional punishment.”

Women, the connexion with whom is forbidden (*agamyâh*) are others than married women; such as common prostitutes.

‘*Çaste*’ means ‘in the case of an accusation.’

‘*Sâhasam*’ means ‘a crime perpetrated by violence.’

‘*Avarṇah*’ means ‘blame.’

‘*Çirah* (head) means ‘punishment.’

The specification of the accusation by the words ‘for adultery,’ is unnecessary, because this accusation has been already mentioned. Likewise are the words ‘where there are many witnesses’ (unnecessary). Therefore an ordeal may take place in every action, even if witnesses be wanting. The indication of the object of the ordeal by the words “in order to clear himself,” is proper only, (if the passage be to her) in this (sense). And it is a common saying, “In actions for high treason and accusations of an offence which causes loss of caste (the defen-

dant) should undergo an ordeal, even if the plaintiff be not ready to undergo the punishment of defeat."

Nārada (says) :

Those who are suspected by kings, those who are accused by Dasyus, and those who wish to clear themselves, shall undergo an ordeal, without (any additional) punishment (in case of defeat).

The ordeal which decides a case after (the lapse of some) time, is the oath.

Nārada has declared the different kinds of this (the latter) :

"(Let (him swear) by truth, (or) let him touch (whilst swearing) a vehicle, arms, a cow, grains, or gold, or the feet of the gods, or of his father or mother ; or (let him swear) by his pious gifts, and his good works ; or let him touch the head of his child, of his wife or of a friend ; or he may also—in case of *any* accusation,—drink consecrated water."

The oaths are declared by Manu (to be resorted to) even on very trifling occasions.

Though consecrated water decides a case only after the lapse of some time, it has been enumerated in the first (division), because it is used in great accusations (also).

Yājñavalkya (says) (II. 96) :

"According to (their) pleasure either of the two may undergo (the ordeal), and the other may take (upon himself) the punishment (in case of defeat)."

This alternative (lies) only at the pleasure of the plaintiff. If he does not wish (to undergo the ordeal), (it falls) on the defendant. Let nobody *oblige* the plaintiff to undergo the punishment.

"The ordeal should be imposed upon the accused by those who know (the rules respecting) the ordeal."

These are the words of Kātyāyana in the Divyatattva.

Here (follow) the rules regarding the different kinds of ordeals appropriate to (different) individuals.

Yājñavalkya says (II. 98) :

"The scales (are appropriate) for women, children, old, blind, or lame persons and Brāhmanas ; fire or water, the seven grains of Yava or poison, for a *Çūdra*."

(The scales are for everybody) without reference to sex or caste or age.

Bāla (is a person) who is younger than 16 years, of whatever caste he may be. (A person who is) older than 80 years (is called) *vriddha* (old).

Here (in this passage it is meant) that the scales only are intended for a Brahman (when the ordeal takes place) at the time generally (appointed for the scales), of which (more) will be spoken (below). But (when the ordeal takes place) at the time (which is fit for the employment) of fire and the like, those (ordeals) are employed even (for a Brahman)."

Therefore Pitāmaha (says):

"All castes can, according to the rule, be cleared by (taking) consecrated water. All the (ordeals) (can be employed in case) of every one, except poison (in the case) of a Brahman."

In the Kālikāpurāṇa (we read):

A hot gold māsha coin should always be given to a man of the lowest caste.

Nārada (says):

"Let (the judge) always examine eunuchs, men bereft of strength, those whose mind is violently agitated, and these three, children, old and sick people, by means of the scales. But neither poison nor water, is prescribed for women; by means of the scales, consecrated water, etc. let him enquire into the hidden truth about them. Those who are in (bodily or mental) pain, shall not clear themselves by the water (ordeal), nor those who suffer of a disease caused by gall or poison. The (ordeal by) fire is not ordained for the leprosy, the blind, those who suffer of a disease of the nails, and the like. Children and women should not be immersed (into water) by those who know the Institutes of law, nor (should this be done) to sick, old or weak men. He should (likewise) not immerse into water those who have no force, and those who have been enfeebled by sickness. When they are immersed, they always die; for little life (is left) in them. He shall not immerse them even if they have come (to court) on account (of an accusation) of an offence perpetrated with violence. Nor shall he make them take (into their hands) hot iron, nor shall he make them clear themselves by (taking) poison.

Vishnu (says):

"(Let him not impose any of the abovementioned ordeals) upon those,

who suffer of a disease caused by the phlegmatic humor, or who are (otherwise) sick, or women or asthmatic persons."

Kâtyâyana (says) :

"Let him not give the ordeal by fire to smiths, nor (that by) water to those who (by their profession) have to work in water (as divers, etc.) nor by any means poison to those who know the application of charms. Let him not order a man, who is engaged on fulfilling a religious vow or who has a disease of the mouth (to undergo the ordeal) of the rice grains.

A man who is engaged on a vrata (vrâtin) (means) a man who performs the milk-vow and the like.

Pitâmaha (says) :

"Consecrated water should not be given by wise (men) to those who drink spirituous liquor, to adulterers, gamblers, or atheists."

Nârada (says) :

"He shall avoid to give consecrated water to a man, who has committed a great crime, or who does not obey the law, an ungrateful (person), a eunuch, a despicable (person), an atheist, a man whose crimes (faults) are (generally) known.

Kâtyâyana (says) :

"But the king should not order (the abovementioned ordeal) for people, who ought not to be touched, for those of the lowest castes, for slaves, barbarians, evil-doers ; nor for those born by prâtilomya (whose mother is of a higher caste than the father).

He should order for them, at the time, the ordeals which are known (to be fit) for the (season).

Known (to be fit) for them are the scales, poison and the like (each of which is fit for some proper season.)

If the person who has to undergo the ordeal is unable (to do so,) the same (Kâtyâyana) prescribes a substitute (to be chosen for him,) in the Divyatattva.

"If there is no hindrance (for the person, who has to undergo the ordeal) as far as regards place or time, then let him undergo it, as it is proper. He can have it performed by another (person) ; that is the rule in the contrary case." Anyena, by another, hârayet, he may cause it to be taken, (means) he may have it performed by a substitute. Viparyaye (in the contrary case), (means) if the person who

has to undergo the ordeal is unable (to do so), let (then another person) do what is appropriate.

In the contrary case, *i. e.* when there is a certainty that the defendant formerly did commit a great crime, such as the murder of his father or other (near relations); or when at some other time (the defendant) was suspected of some other matter, the same (Kâtyâyana) declares (that he should perform) the ordeal through a substitute.

“(In the case) of people who have killed their father, mother, a Brahman, their spiritual teacher, an old man, a woman or a child, of such as have committed a Mahâpâtaka, and especially of atheists, those who bear the sign (of another caste than that to which they belong) of women, of those who are acquainted with the use of charms and yoga (supernatural power acquired by meditation, etc.), or of those who are born in a mixed caste, of those who live or cause others to live in a course of vice;—in the case of such shameful accusations, a justice-loving king should by no means order (the accused to undergo) an ordeal. The ordeal ought to be undergone by good people appointed by these (the abovementioned sinners). Where there are no good men, there they should be cleared by their own people (undergoing the ordeal).” Svakañi (by their own people) (means) by relations.

Here (follow) (the rules regarding) the time (when the several ordeals should take place).

Pitâmaha (says):

“Caitra (March, April) Mârgaśivas (December, January) and Vaiçākha (April, May) are months generally (used for all ordeals), and they do not present obstacles to ordeals.”

The (ordeal by the) scales is ordained (to be employed) at any season, (but) one should avoid it, if the wind blows.

The (ordeal by) fire is declared (to be good) in the dewy, cold and rainy seasons, the (ordeal by) water in autumn and the hot season, that by poison in winter and dewy season.

Poison (is recommended) to be taken in the cold and dewy seasons, (but) other seasons also (at times) are included; because further on (the passage) varshe caturyavamâtrâ, etc. will be quoted.

Nârada (says):

“Consecrated water may be given at any season (of the year), (and) the scales (likewise) may (be employed) at any time.”

Pitāmaha (says further) :

“ The ordeal by fire must take place in the morning, and in the morning the scales (must be employed). The (ordeal by) water ought to be given in the middle of the day to those who wish (to learn) the real state of truth. But the clearing by means of consecrated water is ordered (to take place) during the first half of the day. But in the last quarter of the night should the poison be given, being cold.

These ordeals should take place on a Sunday, thus say the Çishtas, (i. e. those Brahmans who have studied the Vedas and Vedāngas and thereby have become authorities in law).

Now (follow the rules on) the place (where the ordeal ought to take place).

Pitāmaha (says) :

“ The scales must always be made to turn towards the east, unmoveable, in a pure place, near to the flag, in the hall (of justice), or in the gateway of the king's (palace), or on a crossing.”

Nârada (says) :

“ (Let it be placed) in the hall or at the door of the king's palace, in a temple or on a crossing.”

Kâtyâyana (says) :

“ Let him order those men who are accused of a Mahâpâtaka, to undergo the ordeal near the flag, those who (are accused to) have committed high treason, at the door of the king's (palace); those who are born in prâtilomya should undergo the ordeal on a crossing, and wise men know that in other cases (the ordeal should take place) in the midst of the hall (of justice).”

Nârada (says further) :

“ If ordeals are not given at the proper time and place, or undergone by people who claim to be exempted from them, they always cause in lawsuits a false result ; of that there is no doubt.”

Now (follow) the rules which are common to all ordeals :

Pitāmaha (says) :

Then let the judge, who is conversant with the religious law, invoke the gods according to the following rule ; turning towards the east and joining his hands, let him speak : “ Come, come, divine Dharma, approach this ordeal, together with the Lokapâlas (eight protectors of the world) and the crowds of Vasus, Adityas and Maruts.” But if he

has brought Dharma to the scales, he should assign to the subordinate gods their several places.

The same (Pitāmaha says further) :

“ Having placed Indra in the eastern direction, and the lord of the dead in the south, Varuṇa in the west, and Kuvera in the north, he should divide the (other) Lokapâlas, etc., Agni in the intermediate points of the horizon. Indra is yellow, Yama dark-blue, Varuṇa shines like crystal, Kuvera like gold, Agni also (glitters) like gold, and Nirṛiti is dark-blue, Vâyu dark-brown, and let Içâna be red—thus he shall meditate on them in their order. To the south of Indra a wise man should place the Vasus. These eight Vasus are declared to be Dhara, Dhruva and Soma, Apah (the waters), Anila (wind), Anala (fire), Pratyûṣha (early morning), Prabhâsa. Between the lord of gods (Indra) and Içâna is the place of the Adityas. The names of these twelve Adityas are declared to be Dhâtri, Aryaman, Mitra, Varuṇa, Içâna and Bhaga; Indra, Vivâsvat, and Pûshan; and as the tenth Parjanya; then Tvasṭri, then last born, though not last (in power), Vishṇu. But the western side of Agni (between this god and Yama), they know to be the place of the Rudras. The Rudras are recorded to be eleven (namely), Virabhadra, Çambhu and the famous Giriçâ, Aja Ekapâd, Ahi Budhnya, and the unconquered Pinâkin, and Bhuvanâdhibhîvara, and Kapâli, Vitâmpati, Sthânu, and the illustrious Bhava. Between the lord of the dead (Yama) and the Râxâsa (Nirṛiti) let him make the place of the mothers. (They are) Brâhmî, Maheçvari, Kaumâri, and Vaiṣṇavi, Vârâhî, Mahendri, and Câmundâ, accompanied by her Ganas. They know (tell) that Ganeça's place is to the north of Nirṛiti (between him and Varuṇa).

The place of the Maruts is declared (to be) on the northern side of Varuṇa (between him and Vâyu).

The seven Mârutas are said (to be); Gaganasparçana, Vâyu, Anila, Mâruta, Prâṇa, Prâṇeça, Yîva. A wise man should bring Durgâ to the north of the scales: and they prescribe adoration to these deities, (calling each) by his name. Having given to Dharma in the proper order the (offerings), the first of which is the Arghya and the last of which consists of ornaments (in flowers, etc.), he afterwards should give to the subordinate gods the (offerings), beginning with the Arghya and ending with the (presentation of) ornaments.

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(And) he should offer the adoration which begins with the (oblation of) perfumes and ends with the (oblation of the) food.

By (Brahmans) who have studied the Vedas a burnt-offering should be presented in each of the four points of the horizon. Let him offer at these offerings clarified butter, boiled rice Samidhs accompanying the act with the recital of the Sâvitri, the Pranava (Omkâra), and the Svâha at the end."

Havi's (oblation) (means) Charn, boiled rice. The Eastern Mîmamsakas declare in the Divyatattva, that the clarified butter, the boiled rice and the sacred fuel (Samidhah) are offered conjointly, just as at the two Sâmnâya-ishtis, because the deities, (to whom they are offered), are not opposed to each other.

That is wrong.

For (it is declared) in the Sûtra of Aṣvalâyana and the rest : " He cuts off two portions of âjya, he places fuel once on the boiled rice, he cuts off (portions) of the boiled rice twice from the middle and the fore-part (of the heap), and he sprinkles the rice which he has cut off (with ghee). This is the rule for cutting off."

Sruva means, (here) fuel, because it has also this meaning.

(Besides) the conjoint oblation (of the various offerings) is impossible, because (in each case) a different instrument (for completing the oblation) is prescribed (by the Sûtra) hastasya.

But in the case of the two Sâmnâya ishtis the conjoint of oblation (of the ghee, fuel and rice) is proper, because (there) only one instrument, the juhû, is used.

The same (Pitâmaha says) :

" The accused having written the (crime) of which he is accused, on a scroll (of paper) together with the following Mantra, places that (scroll) on his forehead.

And the Mantra (is the following),

" Sun and moon, wind and fire, heaven and earth, the waters, (man's own) heart, and Yama, day and night, the two twilights and Dharma know man's actions."

Nârada (says) :

" Then the judge (who ought to be) a Brahman, who has studied the Vedas and the Vedângas, who possesses fame and a good character, who has extinguished (the passions of) his mind, who has forsaken

envy, who keeps his promises, pure, clever, rejoicing in the welfare of all creatures, who has kept a fast (on the day of the ordeal) in wet clothes, (who has bathed in his clothes), who has cleaned his teeth with water, having worshipped all the gods according to the (prescribed) rule.....

Yâjñavalkya (says II. 97),

“(The judge) having called the accused who has bathed in his garments and fasted from sunrise, shall cause him to undergo the ordeals in the presence of the king and the Brahmans.”

Pitâmaha also (says) :

“Ordeals always (should be ordered) to be performed by the accused when he has fasted one or three days, who is pure, and dressed in a wet garment.”

The same (author says) :

“Surrounded by good men, the king should (order him to) perform this clearing (through an ordeal) and should (order him to) gladden the sacrificial priests, house-priests, and spiritual teachers by presents. A king who orders the ordeal to be performed in this way, after having enjoyed heart-gladdening pleasures, having obtained great fame, he becomes fit to be (united with) Brahma.

Now follows the rule on the (ordeal) of the scales.

Pitâmaha (says) :

“The king should order (his people) to construct a hall for the scales, which (is) broad, high, resplendent, where a man will not be defiled by dogs, Chândâlas or crows, possessing an instrument for (shutting) the doors, protected by watchmen, which contains (jars with) water and the like, which is well furnished.”

Nârada (says) :

“Let him (the king) order (scales) to be made there, of any Khâdira wood, except Çukla Khâdira, which must be free from clefts ; Çuklavarjita (lit. except white) means except white Khâdira wood.

“If there is no (Khâdira) (it should be) made of Çimçapa, or (if that be wanting) of Çala, which must be free from holes, or (it may be made of) iron-wood (arjuna), or Tinduki, or of Tiniça or red sandalwood.

Mâhava gives the following reading (of the passage arjuna²—candana) : The arjuna, Tilaka, Açoka, Tiniça, (or red sandal tree) (should be used).

He should use such like woods for the scales.

Such like (evamvidhâni) means (that he may use) also others, as

Uḍumbara-wood (Indian fig-tree) and the like ; thus (says) Madana.

For this very reason,

Pitāmaha (says) :

“ Having cut (any) tree, that is fit to be used at the sacrifice, preceding the action, as in the case of the sacrificial post, with Mantras (prayers from the Veda), and having worshipped the guardians of the world, wise men should make the scales. The Mantra are addressed to Soma, and to Vanaspati during the cutting, and muttered only. Preceding the action by a Mantra as in the case of the Yûpa (means having muttered) : “ O tree, protect him, etc.”

The two Mantras addressed to Soma and Vanaspati, are both spoken during the cutting, because on account of the Mantras being muttered their object is not visible. (Which Mantras are called) saumyâh, addressed to Soma, that is known. The Mantra addressed to Vanaspati is : Vanaspate Çatavalçosvaroha, (R. V. III. 8.) The transferring of the qualities of the Yûpa to the scales (by the words) asya yûpavat i. e. in the case of this as in the case of the Yûpa, causes the repetition of something established (before).

Pitāmaha (says) :

“ But the scales should be made (in length) four hastas, and the side-posts as long, the space between (the scales and the posts) should be one hasta and a half.”

Vyâsa (says) :

“ But two hastas of each side-post (of the scales) are to be dug into the ground.”

Pitāmaha (says further) :

“ The scale beam is to be made four-cornered, firm, and straight, and hoops should industriously be placed in three places (middle and the two ends).”

The same (goes on) :

Having fastened the two basins to the two ends (of the beam), let him place kuça-gras, the tops of which are directed to the east, also on the two basins.

Let him weigh those who undergo (the ordeal) on the western scale, on the other (he shall place) clean clay, bricks or ashes, (but he shall avoid stones, potsherds, bones.

Nârada (says) :

“ Having firmly tied the scales (plates) to the two rings (at the ends) of the scale-beam, let him place in the one scale the man, in the other a stone. On the northern side scale let him place the man, on the southern (side) the stone. (Or) let him fill the basin with bricks, dust or clods of earth.”

The same (Nârada) declares the manner of examining (the respective weights of the man and stone);

“ (Before the weighing) the examiners (should) always (make) the scale-beam even by means of two mason's plummets, and (people who are) expert (in this business) should (always, when weighing,) pour water on the scale-beam.”

“ That scale-beam on which the water does not flow, is what one should know—to be *even*.”

Pitâmaha (also) prescribes the two plummets (to be used) in order (to produce) evenness :

“ At the two ends should he make two arches (torana), (which should be) higher than the scale-beam by ten fingers, and a mason's plummet (should hang down from each arch (torana) made of clay, tied (to the arch) by a string, touching the corner of the scale-beam.”

Pitâmaha (further says) :

“ Having weighed the man first, he should make him descend from the scale; but he should always adorn the scales with wimples and banners; then (a Brahman) who knows the Veda should bring the gods near to it by this rule, with drums and horns, perfumes, wreaths and ointments.”

Nârada (says) :

“ Let him first honour the scales, with red sandalwood powder, perfumes and flower-wreaths, curds, cakes, unground (rice) and the like; then he should honour the learned (Brahmans).”

Yājñavalkya (says) : (II. 100 and 101) :

“ People who are expert in weighing should make the accused ascend the scale, (and) when they have placed (in the other scale) a weight equal to his (weight) and made a line on the scales, he should be ordered to descend. (Before he ascends the scale for the second time, the accused) should address the scales with this Mantra :

“ “ Thou, oh balance, hast been formerly constructed by the gods to be the abode of truth, therefore, oh good (goddess), speak the truth

(now), and free me from suspicion. If I have done wrong, mother, make me descend ; if I am pure, let me ascend.' "

Nârada (says) :

" Having bound (the accused) by oaths, he (the judge) should again make him ascend the scales in (a place) sheltered from wind and rain, having tied to his forehead a scroll (on which the accusation is written). "

Samayaih parigrihya, having bound him by oaths. These (oaths) are given (in detail) by Vishnu :

" The hells of the murderer of a Brahman, the worlds where the liars go to, those are the worlds (destined) for him who practises fraud at the time of weighing. "

Nârada declares the address (to the scales) at the time of ascending it for the second time (to be the following) :

" Thou knowest the bad and good deeds of all creatures ; thou alone, oh god, knowest, what men do not know ; this accused man is weighed on thee, therefore deign to protect him who is under suspicion, according to truth. By truth thou excellest gods, Asuras and men. "

" Thou art truthful, O divine one, in discerning right and wrong. Sun and moon, wind and fire, heaven and earth, the waters, the heart and Yama, day and night, and the two (gods of) the twilight and Dharma know the deeds of men. "

Pitâmaha (says) :

" A Brahman of good character, who knows astronomy, should examine the time (when the accused has ascended the scales for the second time). Five Palas are the time allowed for the ordeal—that should be known to (those who are) expert (in the matter). But the king should employ as examiners the best of Brahmans who (will) announce the result as they see it, (who are) wise, pure not covetous. All the witnesses (after the lapse of five Palas) announce to the king (whether the accused) is guilty or not guilty. "

Vinâdyah (means) Palas ; because (it is written) in the Smṛiti, that the time (required) in pronouncing ten long syllables is called a breath, (Prâṇa, and) six (such) breaths are one vinâḍikâ (Pala).

Nârada (says) :

" If the man who is being weighed, rises, he shall doubtlessly be guiltless ; if (the scales) remain even, or if it sinks, he shall be guilty. "

Vṛiddhih (lit. increase, means) rising. *Hāni* (lit. abandonment means) sinking.

Pitāmaha (says) :

“If (the scales remain) even, (the judge) should know that he is a little guilty ; but a very guilty man sinks.”

The smallness (of the guilt is implied, if the accused has) committed a crime once (or) without intention.

But when it is asserted in the (scroll of impeachment) which he wears on his forehead, that the crime has been (either) committed only once or without intent, and there is a conflict of evidence regarding the crime only, then, if the ordeal has been instituted and evenness (of the scales has been the result), it must be repeated, because in such (a case) the fault cannot be a small one.

Therefore Brihaspati (says) :

“A man who (remains) level with that (counterweight) should be weighed again ; a man who rises shall have won (his cause).”

Kātyāyana names another reason for repeating (the ordeal) :

“If the scale, or the beam, or the string should break, or if there should be a doubt about the guiltlessness (of the accused), he (the judge) should examine the man again.”

Vyāsa (says) :

“If the scale, or the beam, or the two hooks, or the string or the upper beam (which joins the two posts) break, the king should allow (the accused) to try to clear (himself) a second time.”

But these (opinions of the lawyers) refer (to cases) where the reason for the breakage is visible. But if no reason for the break is apparent, he is certainly guilty.

For in another Smṛiti (we read) :

“If the scales, or the beam, or the two hooks, or the string, or the upper beam, should break, then he shall declare (the accused) guilty.”

Kaxa the basins of the scales.

Axa (axle, means) the upper beam (joining the two feet or side beams) which holds the scale beam.

The eastern (lawyers say) :

“Only the weighing is repeated, not the whole ceremony with (all its) parts (as prayers, etc.)”

Madana (says) :

“In order to avoid defects, the proceedings with all their details should be repeated, in the same manner (as before).”

Now follows the description of the proceeding.

The person who has to conduct the ordeal goes, on an auspicious day, to one of the before-mentioned trees and cuts it, whilst reciting the Mantra: “O plant, protect me.” Then he mutters (the verse), “Somodhenum” (R. V. I. 91-20)—Gautama is its Rishi, Soma the deity, the metre is Trishtubh, and the manner of its recitation is Japa (muttering) Somodhenum, etc—, and (the verse), “Vanaspate (RV. III. 8, 11”) its Rishi is Viçvâmitra, the son of Gâdhi, its deity Vanaspati, its metre Trishtubh, the manner of reciting it is Japa, “Vanaspati çatavalçah, etc.” Then he worships the guardians of the world, Indra and the rest, each separately, and makes the scale-beam four hastas long, four fingers thick, four-cornered in the middle, and at both ends four fingers thicker, and in the middle fitted with a hook or ring which is turned upwards, and at each end with a grapple or ring which is turned downwards.

Some (lawyers) say, that he then should make an altar, seven or five hastas long and four fingers high. Then he shall there or in another clean place dig into the earth, two hastas deep, two four-cornered posts six hastas long, and surmounted by tops. Above the earth will remain four hastas (of the posts), besides the top portion; the distance between those two posts should be two hastas or one hasta and a half. Between the two tops he shall place a piece of the wood which is fitted with a grapple (lit. crab), a ring, a hook or the like instrument turned downwards, for fastening the scale-beam to it. From that (beam) hangs the scale-beam with its upper hook or ring or the like, and two boards should be tied to the ends (of the beam), each with three strings. Having dug into the earth a pair of posts, (the one) to the south (the other) to the north, at a distance of two hands (from each other), at the eastern end, of the scale-beam, he shall place a joining-piece over them. This is the arch (*torana*) and that should be ten fingers higher than the balance. He shall make an (arch) of this kind also on the western side of the scale-beam. In order to know if the scales are even, he must make two mason's plummets, of clay, in the shape of balls, hanging down from the arches, tied to them by strings, and touching the ends of the scale-beam. He shall spread on the scales Kuça-grass blades with their tops turned to the east. Then

the Prâdvivâka, having fasted one (day), shall make the accused, who has fasted one (day), or in case of heavy accusation, if he can do it, three (days), and who has bathed in his garments, ascend the western scale on a Sunday after sunrise, and having placed in the eastern scale stones, bricks, clay, or the like, shall make (this weight) equal (to that of the accused). Truthful Brahmins and goldsmiths shall make an enquiry into this (if the scale-beam stands even) by throwing water (on it) and the like. Then (the Prâdvivâka), having made a line (in the scale) in order to know the place, where (the accused) was sitting at the time of being weighed (for the first time), he shall make him to descend.

Then the accused, having named the place and the time (where and when the ordeal takes place), and having vowed, "In order to prove my innocence, I will undergo this ordeal," shall elect, by presenting clothes and the like, besides the Prâdvivâka four priests (to perform the following sacrificial ceremonies).

The great doctors in Smriti lore say, that also the Svastivâcana should be performed. The Prâdvivâka, standing with his hands joined, shall bring Dharma to the scales (pronouncing the following prayer), accompanied by the sound of musical instruments, "Om, come, come, divine Dharma, approach this ordeal together with the guardians of the worlds, the Vasus, Âdityas, and, the flocks of the Maruts." Afterwards he shall bring the subordinate deities.

He uses for bringing Indra (near), "Omindramviçva" (R. V. I. 11-1,) which verse (was seen by) Madhuchandas, (and has for its deity) Indra, (and for its metre) Anushtubh. The application (of the verse remains) everywhere the same. (Having muttered) "indramviçva, etc." (and having with these words) "Indra come, mayest thou stand here," brought Indra to the eastern (corner of the place), he should meditate on the yellow colour. (He then speaks the verse) "Yamâya somam," (R. V. X. 14-13) (of which) Yama (is the Rishi), Yama (the deity), and Anushtubh (the metre). (Having muttered the verse) "Yamâya somam," (and having by the prayer) "Yama come hither, mayest thou stand here," brought Yama to the southern (corner), he should meditate on the dark-blue colour. (He then recites this verse) "Tvamnâh," (R. V. IV. 1, 4 of which) Vâmadeva (is the Rishi), Varuna (the deity), and Trishhtubh (the metre). Having muttered "Tvamnâh" (R. V. IV. 1, 4 of which) Vâmadeva (is the Rishi), Varuna (the deity), and Trishhtubh (the metre). Having muttered "Tvamnâh" (R. V. IV. 1, 4 of which) Vâmadeva (is the Rishi), Varuna (the deity), and Trishhtubh (the metre).

varunasya," (and having with the prayer) "Varuna come hither, mayest thou stand here," brought Varuna to the western (corner), he should meditate on the colour of crystal.

Having brought Kuvera with the prayer from the Yajurveda "Râjâdhirâjâya" (and with this prayer) "Kuvera come hither, mayest thou stand here," to the northern (corner), he should meditate on the colour of gold. (He then recites the verse) "Agnim," (R. V. VIII. 44, 3) (of which the) Rishi is Medhâtithi, (the deity) Agni, (the metre) Gâyatri. Having muttered "Om agnim dûtam" (and having brought Agni (with the words) "Agni come hither, mayest thou stand here," to the corner sacred to Agni (south-east), he should meditate on the colour of gold. (He then recites the mantra), "Moshu" (R. V. I. 38, 6), (of which the Rishi is) Ghora of the race of Kanva, (the deity) Nirriti, (the metre) Gâyatri. Having brought Nirriti (by muttering) "moshunah," (and) "Nirriti come hither, mayest thou stand here," (to the south-western corner), he should meditate on the dark-blue (colour).

(He then recites this mantra) "Tavavâyo" (R. V. VIII. 26-21,) of which the Rishi is) Vyaçva, the deity Vâyu, (and the metre) Gâyatri. Having brought Vâyu (by muttering "Tavavâyav," etc. and, "Vâyu, come, etc." as before (to the north-western corner), he should meditate on the brown (smoke) colour.

(He then recites), "tamiçânânam," etc. (R. V. I. 89, 5) (whose Rishi is) Gautama, (whose deity is) Içâna, (whose metre is) Jagati. Having brought Içana by muttering "tamiçânânam," etc. (and) "Içâna come," etc. as before (to the north-eastern corner), he should meditate on the red colour.

To the right of Indra he should bring (the eight Vasus (with this verse): "Imayâtra vasavah" (R. V. VII. 39, 3), (whose Rishi is) Vasishtha, the son of Mitra and Varuna, (whose deities are) the Vasus, (whose metre is) Trishtubh. He should mutter "imayâtra, etc." (and the invocation) "Vasavas come hither, stand here."

The eight Vasus are declared to be; Dhara, Dhruva, Soma, Apah, Anila, Anala, Pratyûsha, Prabhâsa.

He places between Indra and Içâna the twelve Âdityas (with this Mantra); "tyâmnu" (R. V. VIII. 561) (whose Rishi is) Sammada Matsya, (whose deities are) the twelve Âdityas, (whose metre is the) Gâyatri. (He should mutter) "tyâm nuxatriyâ, etc."

Dhâtri, Aryaman, Mitra, Varuṇa, Amṛta, Bhaga, Indra, Vivasvat, Pūshan, Parjanya as the tenth, next Tvashtri, then Vishnu last not least, these are declared to be the twelve Ādityas, by their names. He brings to the western side of Agni the eleven Rudras (by this verse) “*ārudrāsah*” (R. V. 5. 1.), (whose Rishi is) *Çyavaçva*, (whose deities are) the eleven Rudras, (whose metre is) *Jagati*. (He should do so by muttering) “*ārudrasah*” (and the prayer,) “*Rudras come hither.*” As the eleven Rudras are recorded *Virabhadra*, *Çambhu*, and the glorious *Giriça*, *Ahir-budhnya*, *Aja Ekapād*, and the unconquered *Pinâkin*, *Bhuvanadhîçvana*, and *Kapâlin*, the lord of men, *Sthânu*, *Bhava*, and *Bhagavat*. Between *Yama* and *Nirṛiti* he places *Brahman* (masc.) (with this verse) “*Brahmâ yajnânâm*” (whose Rishi is) *Vâmadeva*, *Gotama*’s son, (whose deity is) *Brahman* (masc.), (whose metre) *Trishṭubh*. (He should do so by muttering) “*Brahmâyajnânâm*” (and this invocation, “*Brahman come*) *hither.*” (And he brings to the same place) the mothers (with this verse) “*Gaurirmimâya*,” (R. V. I. 164, 41) (whose Rishi is) *Dîrghatamas*, (whose deity is) *Uma*, (and whose metre is) *Jagati*. (He should do so by muttering) “*gaurirmimâya*,” (and the invocation)” *O mothers, come hither, stand here.*”

The seven mothers are *Brâhmî*, and *Maheçvarî*, *Kaumâri*, *Vaishnavî*, *Vârâhî*, *Indrâṇî*, *Câmunḍâ*. To the north of *Nirṛiti* he places *Ganeça* (with this mantra), “*Gaṇânâmtvâ*” (R. V. II. 23, 1), (whose Rishi is) *Gṛtsamada*, (whose deity is) *Gaṇidhipati* (the lord of hosts), and the (metre) *Jagati*. (He should do so by muttering) “*Gaṇânâmtvâ*” (and the invocation “*O Ganapati, come*) *hither, etc. etc.*” To the north of *Varuṇa* (he places) the *Maruts* (with this mantra), “*Marut yasyâ*” (R. V. I. 86, 1), (whose Rishi is) *Rahugana*, (deity) the *Maruts*, (metre) *Gâyatri*. (He should do so by muttering) “*Marut yasya*” (and the invocation, “*Maruts, come*) *hither,*” etc.

The *Maruts* are declared to be seven, viz., *Gaganasparçana*, *Vâyu*, *Anila*, *Mâruta*, *Prâṇa*, *Prâṇeça*, *Jivâ*.

At the north side of the scales (he places) *Durgâ* (with this mantra) “*jâtavedase*,” (R. V. I. 99, 1, (whose Rishi is) *Kaçyapa*, (deity) *Durgâ*, (metre) *Trishṭubh*. (He should do so by muttering) “*jâtavedase*” (and the invocation “*Durgâ, come*) *hither,*” etc.

When thus he has placed these deities, he should worship them

(saying) "I give the Arghya to Dharma, adoration." Having in this manner and the like, at every new gift, repeating these words, given to Dharma the Arghya, water for the feet, water for rinsing the mouth, the honey-mixture, water for rinsing, a bath, clothes, a Brahmanical cord, water for rinsing the mouth, and finally ornaments, such as a crown, bracelets, and having presented the gifts beginning with the arghya and ending with the ornaments (as above) to Indra and the rest, (pronouncing) their respective names preceded by the word Om, and standing in the dative case (Om indrâya arghyam prakalpayâmi-namah, etc.) according to the fit time for giving the gift, and having (then) presented to Dharma perfumes, flowers, frankincense, lamps and eatables, such as curds, cakes, unground rice, he shall also present perfumes, etc., to Indra and the other gods in the manner before described. And the perfumes, flowers, etc. must, when Dharma is worshipped at the ordeal of the scales, be coloured red: to Indra and the other (gods) they may be offered in the state in which they are obtained. The judge shall perform the ceremony which ends with this (act just described).

Then the burnt-offerings are to be offered by four priests, after common fires have been kindled in the direction of the four points of the horizon.

Then having pronounced the Gâyatri together with the word Om, (and) again Om followed by the word svâhâ, they shall offer of each of (these, viz.) clarified butter, boiled rice and firewood, one hundred and eight oblations to Savitri. Then the accused shall write the matter he is accused of, on a scroll and the prayer "Sun and moon, wind and fire, heaven and earth, the waters, the heart and Yama, day and night, and the two twilights and Dharma know the acts of man." Then he (the judge) should correct (the writing) and place the scroll on the accused's forehead; and these ceremonies which begin with the placing of the gods and end with placing of the scroll on (the defendant's) head, are common to all ordeals.

Then the Prâdvivâka shall address the scales with this prayer:

"Thou, O scale, art created by Brahman in order to examine the evil-minded. Because (thy name contains) the letter *dh*, thou art Dharma. Because through that letter, thou causest constantly to be known (to men) a bad man, therefore thou art called dhâtâ. Thou

knowest the good and evil deeds of all creatures. Thou alone knowest everything which men know not. This accused wishes to be cleared, therefore deign to save him, according to justice, from the suspicion (cast upon him)." Then the accused addresses the scales in the following manner) :

"Thou, O scale, art the abode of truth, having been made (so) formerly by the gods. Therefore, O good one, speak the truth and free me from suspicion. If, O mother, I am a sinner, then make me descend ; if I am innocent, let me rise upwards.

Then the Prâḍvivâka makes the accused, to whose forehead the scroll has been tied, reascend the scales in (exactly the same) place, and sitting (in the same manner) as (at the first weighing), and remain there (on the scale) for the space of five Palas. In that time (the accused's) innocence or guilt must be examined and announced by holy Brahmins to the king and to the members of the court. Then he descends and gladdens the Prâḍvivâka, the Brahmans and the priests (who have officiated) by rewards. Then, having dismissed the gods (with these verses) "Brahmanaspati arise" (Rigveda I. 40, 1) and "go ye crowds of gods," etc., he gives everything (the presents offered to the gods) to the judge.

Now (follow) the rules for (the ordeal by) fire.

Pitâmahâ (says) :

"I will declare the rules (for the ordeal) by fire, as they are ordained by the institutes of law. Let him order to be drawn eight circles, and also in the eastern (direction) a ninth. The first circle is declared to be sacred to Agni, and the second to Varuna, the third to Vâyu, the fourth to Yama, but the fifth to Indra, the sixth to Kuvera, the seventh to Soma, the eighth to Savitri, and the ninth to all the gods : thus know those, who know the Vedas."

But Madana has declared : "They know that the eighth is sacred to all the gods, but that which is the ninth (drawn in the eastern direction) (should be) great and sacred to the earth ; they should be smeared with cow-dung and sprinkled with water."

The same declares the size of the circles.

"(Measured by) thirty-two fingers should be the distance that separates circle from circle. The space occupied by the eight circles should be 256 fingers."

Mandālât, "from circle" (means) from the beginning of the circle.

The space occupied by a circle and the intervals between it and the next, should be thirty-two fingers; that is the meaning (of the passage).

Amongst these the circle occupies (a space of) sixteen fingers, and the interval between two circles as much, because Yâjnavalkya says; "it ought to be known, that (each) circle occupies sixteen fingers, and the interval (between two) as much."

If the foot-print of the person who is to be cleared (by the ordeal) (occupies) more than sixteen fingers, then the distance between the two circles should be made less than sixteen fingers. If the (foot-print) of the person who is to be cleared (by the ordeal) (occupies) less than sixteen fingers, then another circle, just as broad as his foot-print, ought to be drawn inside the circle occupying sixteen fingers.

But if Nârada has written (these words), "thus two hundred, exceeded by forty (should be the measure), if (one) measures the space by fingers," that is to be understood (of the first eight circles), leaving out the portion of ground between the eighth and ninth circle, because it is not necessary for the accused to step through that.

If the reading of the Kalpataru is; "the ground prepared is thus said to be (two hundred) and twenty-four (fingers)," the number of the fingers must be added up, leaving out the first circle, where the accused stands (and takes the fire on his hands).

"Blades of Kuça-grass ought to be placed in every circle, according to the injunction of the institutes of law, and the accused should place his foot on these; that is the rule."

In the Mitâxarâ and in the Madanaratna (we read):

"He should offer in the fire one hundred and eight oblations of clarified butter, in order to propitiate (it)."

And Vijnâneçvara (says), that this burnt-offering should be offered with the prayer, "To Agni, the purifier, Svâhâ."

Nârada (says):

"A man who is by caste a smith, or expert in working with fire, or otherwise acquainted with the proceeding, should heat the iron in the fire—a ball of iron (heated till it becomes) of the colour of fire, throwing sparks, well prepared."

Pitāmaha (says) :

"Having made a ball of iron, without corners, (perfectly) smooth, equal to eight fingers (in circumference) and to fifty palas (in weight), he should heat it in the fire."

In the Kālikā Purāṇa (we read) :

"The king should give to the accused an iron (ball), weighing fifty palas, twelve fingers in circumference, consisting (as it were) of fire only, (heated by) blowing (with bellows)."

But Çankha and Likhita declare that the ball must weigh sixteen palas, (in the passage) beginning thus :

"But having taken, into his joined hands, a fire-coloured ball sixteen palas in weight, enveloped in seven Aṣvattha-leaves." And this (ball weighing sixteen palas) is for a weak man.

The ball should be heated three times, because Nārada says : "this (ball) being heated for the third time."

There (at this ordeal) after the ball has been heated for the first time, it is thrown into water ; when it has been heated (for the second time), it is (again) thrown into water ; and whilst it is again being heated the Prāḍvivāka should perform (the ceremonies), beginning with the bringing near of the gods, and ending with the placing of the scroll on the forehead (of the accused).

Then (at this stage of the proceedings) Pitāmaha mentions a peculiarity in the worship of the fire :

"Then the king should order the fire to be worshipped with red sandy ointment and perfumes, and also with red flowers."

Hārīta (says) :

"He (the accused) should then place himself, facing the east, with outstretched fingers, in wet garments, clean, having tied to his forehead the scroll."

The words "the accused" must be understood.

Pitāmaha (says) :

"He shall place himself in the first circle, facing the east, with his joined hands (stretched towards the) east, being pure."

Nārada (says) :

"In all wounds or contusions (which he may happen to have) in his hand, let him make (marks in the shape of) swan's feet ; and he should look at them again (after the ordeal) (and he should make)

the hands variegated by dots (with a coloured substance)."

Yājñavalkya (says) :

"Having marked his hands, by crushing (in them) some rice, he should place (in them) seven *Āṣvattha*-leaves and tie them as often with a string."

(The word) *tāvat*, "often," qualifies the action.

Vijñāneṣvarā means to say therefore "he should tie it seven times."

Madana (on the other side) says :

"*Tāvatsutram*, 'so much string' means a collection of strings by so much, therefore he should tie (the leaves) once with seven strings taken together."

Pitāmaha (says) :

"Let him place in his hands seven *Pippala*-leaves, unground rice, flowers, curds, and tie them there with a string."

The verses with which the *Prādvivāka* addresses, on this occasion, the fire contained in the ball, will be declared in the *Prayoga*.

Yājñavalkya (says) :

"Thou, O *Agni*, goest into the interior of every creature, O purifier, O sage, speak the truth in regard to my good and bad deeds, like a witness. He shall place into both the hands of the accused, who has thus spoken, a fire-coloured, smooth iron ball, fifty *palas* in weight."

Pitāmaha (says) :

"Then the king, who is intent upon exercising justice, or a (man) ordered (to do so), shall place it (the ball) with pincers in his hands."

Nārada (says) :

"Having taken it (the ball) into his hands, being ordered (to do so) by the *Prādvivāka*, (and) standing in one (of the circles) he shall walk over seven others, walking straightforward."

Pitāmaha (says) :

"He (the accused) should not walk quickly but steadily and slowly, he should not overstep (any) circle, nor should he place his foot into the intervals, and having reached the eighth circle, he shall throw it (the ball) down into the ninth, (if he is) a wise man."

But the ball must be thrown down into the ninth circle, which is covered by *Kuṣa*-grass.

For thus the *Kālikā Purāṇa* (says) :

"And he should walk (through) seven circles, each sixteen fingers

by measure, and (over) as much (distance) in the intervals. Having walked (this distance), he shall throw (it) down on fresh Kuça-grass (which is strewn in the ninth circle)."

Pitāmaha (says) :

"Then he should place in his (the accused's) hands, rice with its husk, or barley (yava). But if he rubs them to pieces without hesitation and shows no change (then in his hands) at the end of the day, he shall declare him to be innocent."

Kātyāyana (says) :

"If the accused stumbles, or is burnt anywhere else (than in his hands), the gods do not consider that burn (as a proof of guilt) ; he shall allow him (to perform the ordeal once) more."

Yājñavalkya (says) :

"If the ball falls from his hands, or a doubt (arises whether it has been done properly), he should take it (the ball) again."

Now (follows) the manner of proceeding.

After the place has been purified in the morning, the nine circles should be drawn in the evening. Having made the first amongst these sixteen fingers broad, he divides a space of thirty-two fingers (just) before (the first circle) in two parts. The second part (of these) he makes of the size of the (accused's) foot, the rest becomes the interval. And having finished in this manner, beginning from the third and ending with the eighth circle, and having before (the last) left a space of sixteen fingers in breadth, he makes a ninth circle of an undefined size. And thus the space (occupied) by the eight circles and (eight) intervals together, is two hundred and fifty-six (fingers). Eight grains of (yava) barley measured across their thickest part, or three rice grains in their husks measured from top to end, are declared to be equal to a finger.

A spān (vitasti) contains twelve fingers. A hasta 'ell' (or 'cubit,' from elbow to top of fingers) is (equal to) two spans. A Daṇḍa, 'yard' is (equal to) four ells. Two thousand yards make one Kroça, and four Kroças make one Yojana.

The span and the other (measures) will be used (in passages occurring) below.

Then the judge,* after having worshipped, in their order, the gods presiding over the nine circles, of which the western is the first, viz.

Agni, Varuna, Vâyu, Yama, Indra, Kuvera, Soma, Savitri, and all the gods, (and) having kindled a common fire in a place that lies to the south of the space occupied by the circles, offers one hundred and eight oblations of butter, (saying): "To Agni the purifier, svâhâ!" (This is done) in order to propitiate (Agni).

Then having placed into that fire a round, smooth, iron ball, without corners, eight fingers in circumference and weighing fifty palas, he performs, whilst it is being heated, the ceremonies described in the rules for the ordeal by the scales, beginning with the bringing near of Dharma and ending with the burnt-offering; (and) when it is being heated for the third time, the Prâdvivâka should address Agni, who dwells in the iron ball, with the following verse:

"Thou, O Agni, art the four Vedas, thou art called at the sacrifices, thou art the mouth of all gods, thou art the mouth of all speakers of divine knowledge, thou livest in the bellies of the creatures, therefore thou knowest (their) guilt and innocence. Because thou purifiest from sin, therefore thou art called the purifier. To the guilty show (thy power), O purifier, shine with brilliancy.

"But be propitious to those who are of innocent mind, O thou who eatest the oblations.

"Thou, O Agni, walkest in the interior of all creatures as a witness. Thou, O god, knowest what men do not know. This man, who is accused, wishes to be cleared, therefore deign to save him from suspicion, according to truth."

In order to clean the iron, having thrown the heated iron-ball into water, it should be again heated and again thrown into the water, and then again heated,—it is the third heating.

The judge, after having taken up the well-heated, fire-coloured iron-ball, which has been thus addressed, with a pair of pincers, and holding it before the person, who undergoes the ordeal, who has fasted, bathed, is in his wet garment, wears the scroll on his forehead, and stands in the western circle, he places it into his hands.

The latter (before taking it) addresses it with the following (verse):

"Thou, O fire, dwellest in all creatures, O purifier, speak thou the truth in regard to my guilt or innocence, O sage!"

The "preparation of the hands" consists, in crushing rice in them

and joining them, in marking the black and red spots, the wounds and weals in them and the like with lack-juice and the like, in placing in them seven equal Aṣvattha-leaves, or (on failure of them) seven Arka leaves, or seven Qamī-leaves or seven Dūrva-leaves, rice grains, i. e. rice-grains wetted with whey and flour, and in tying up (the whole) seven times with seven white threads. Then the person who undergoes the ordeal, should walk through the circles, beginning with the second and ending with the eighth, and having thus made seven steps, throw the iron-ball, which he holds in his joined hands, into the ninth circle.

Then he should again crush rice (in his hands), and if his hands are not burnt he is innocent.

Now follows (the rule for the ordeal by) water.

Pitāmaha (says) :

“Now I will declare the rule (for the ordeal) by water, the eternal law. A wise (judge) should order to be made a place (purified by the application of cow-dung), then he should devoutly worship arrows with lamps and incense, and a bow made of bamboo, with auspicious flowers and incense, and afterwards perform the ordeal.”

The construction is; “he should worship the arrows with lamps and flowers.”

The worship must take place in the (purified) space.

Nārada describes the size of the bow :

“The strong bow ought to be understood to be one hundred and seven fingers long, (the bow of) middling (strength) one hundred and six, and the weak bow one hundred and five; this is the rule regarding the bow. But let a wise (judge) shoot three arrows with the bow of middling (strength), having made a target at the distance of one hundred and fifty hastas.

Saptaçatam (lit. seven hundred) means one hundred and seven fingers long. In the same manner must be interpreted the expressions shaṭçatam (six and hundred), pancaçatam (five and hundred).

Kātyâyana (says) :

“And he should make the arrows (used) at the ordeal without iron tops, only consisting of a piece of bamboo; but the bow-man should shoot strongly.”

Nārada (says) :

“But going to a place full of water, he should make an arch, as

high as the ear of the accused, on even and pure ground. He should first worship Varuna with perfumes and fragrant garlands, with honey, milk, clarified butter, etc., being of collected mind. A Brahman, Xatriya or Vaiçya, who is neither a friend nor a foe (of the accused), should be placed in the water where it reaches up to his navel, (and he must be) a man strong like a post."

Pitāmaha (says) :

"First the king should place in the water a man, (strong) like a post, and then having ordered the person who undergoes (the ordeal) to go into the water, facing the east, he should then bring near (by invocation) the gods, and address the water."

The gods, i. e. Dharma and the rest (*see above*).

That he should perform the (ceremonies), beginning with the bringing near of the gods and ending with the placing of the scroll (on the accused's forehead), this and the like (and) the verses addressed (to the water) must be looked for in the (description) of the manner of proceeding.

Vyāsa (says) :

"'By truth protect, O Varuna;' having conjured the water (thus), and taking hold of the thighs of the man who stands up to his navel in the water, he (the accused) should enter the water."

Xam means water; *abhicāpya* (lit. having conjured) means having addressed.

Bṛihaspati (says) :

"When he has made the (accused) man enter the water he should discharge three arrows."

Pitāmaha (says) :

"The bow-man should be a Kshatriya or a Brahman, who follows his (a Kshatriya's) occupation, (who is) not hard hearted, of subdued passions, dressed and pure."

Kātyāyana (says) :

When (the arrows) have been discharged, the submerging ought to take place, and at the same time the starting (to fetch the arrows.)

The meaning of the word *sāmakālika* "at the same time," is that (it is to take place) at the same time as the submersion.

Nārada and Pitāmaha (say) :

"A young, swift man should go according to his utmost power from

the place of shooting to where the middle arrow (lies). Another man of the same qualities, having received the middle arrow, should quickly go back to the place, whence the (first) man came. But if the arrow-bearer, arriving, sees him not, and (he is) in the water, then he shall declare him to be cleared, otherwise he shall be guilty, though he may show only one limb, or if he has gone to another place from that where he entered before. 'One limb' means the ear.

And Kātyāyana (says) :

"Of whom he does only see the (top of the) head, and neither the ears, nor the nose, at his entering in the water, him also he should declare to be innocent."

Pitāmaha (says) :

"The (place where) the arrow falls is to be used (as the starting point for the second runner), and not a (place to which the arrow may have glided)."

Nārada (says) :

"Those two runners who are the swiftest among fifty, should be appointed there (at the ordeal) in order to bring the arrow."

Now (follows) the manner of proceeding.

The place of (the ordeal by) water (is described as follows).

A river, the ocean, a lake, a natural water-course, a pool or a tank and the like (places) containing quiet water, should be used. One should avoid a small or unclean (place), and one that is full of grass, reed, waves, mire, alligators, leeches, fish and the like, one which is quick-flowing and the like. There, in water which reaches up to the navel, a pillar for (fulfilling) the law should be made from a tree whose wood can be used at the sacrifice. Near this, on the western bank an arch, reaching up to the ear of the accused, should be made.

A bamboo bow of one hundred and six fingers length, and three arrows made of bamboo, without iron tops, should be placed near this. A target is to be placed on cleared ground, one hundred and fifty ells from the arch. Then after having worshipped the bow and the arrows with white sandal-wood and garlands, having brought Varuna (by invocation) to the water and worshipped him, and having completed the above described (ceremony), which begins with conveying of Dharma to the bank of the water and ends with the burnt-offering,

high as the ear of the accused, on even and pure ground. He should first worship Varuna with perfumes and fragrant garlands, with honey, milk, clarified butter, etc., being of collected mind. A Brahman, Xatriya or Vaiçya, who is neither a friend nor a foe (of the accused), should be placed in the water where it reaches up to his navel, (and he must be) a man strong like a post."

Pitāmaha (says) :

"First the king should place in the water a man, (strong) like a post, and then having ordered the person who undergoes (the ordeal) to go into the water, facing the east, he should then bring near (by invocation) the gods, and address the water."

The gods, i. e. Dharma and the rest (*see above*).

That he should perform the (ceremonies), beginning with the bringing near of the gods and ending with the placing of the scroll (on the accused's forehead), this and the like (and) the verses addressed (to the water) must be looked for in the (description) of the manner of proceeding.

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"The bow-man should be a Kshatriya or a Brahman, who follows his (a Kshatriya's) occupation, (who is) not hard hearted, of subdued passions, dressed and pure."

Kātyāyana (says) :

When (the arrows) have been discharged, the submerging ought to take place, and at the same time the starting (to fetch the arrows.)

The meaning of the word *samakālika* "at the same time," is that (it is to take place) at the same time as the submersion.

Nārada and Pitāmaha (say) :

"A young, swift man should go according to his utmost power from

the place of shooting to where the middle arrow (lies). Another man of the same qualities, having received the middle arrow, should quickly go back to the place, whence the (first) man came. But if the arrow-bearer, arriving, sees him not, and (he is) in the water, then he shall declare him to be cleared, otherwise he shall be guilty, though he may show only one limb, or if he has gone to another place from that where he entered before. 'One limb' means the ear.

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Nārada (says) :

"Those two runners who are the swiftest among fifty, should be appointed there (at the ordeal) in order to bring the arrow."

Now (follows) the manner of proceeding.

The place of (the ordeal by) water (is described as follows).

A river, the ocean, a lake, a natural water-course, a pool or a tank and the like (places) containing quiet water, should be used. One should avoid a small or unclean (place), and one that is full of grass, reed, waves, mire, alligators, leeches, fish and the like, one which is quick-flowing and the like. There, in water which reaches up to the navel, a pillar for (fulfilling) the law should be made from a tree whose wood can be used at the sacrifice. Near this, on the western bank an arch, reaching up to the ear of the accused, should be made.

A bamboo bow of one hundred and six fingers length, and three arrows made of bamboo, without iron tops, should be placed near this. A target is to be placed on cleared ground, one hundred and fifty ells from the arch. Then after having worshipped the bow and the arrows with white sandal-wood and garlands, having brought Varuna (by invocation) to the water and worshipped him, and having completed the above described (ceremony), which begins with conveying of Dharma to the bank of the water and ends with the burnt-offering,

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"First the king should place in the water a man, (strong) like a post, and then having ordered the person who undergoes (the ordeal) to go into the water, facing the east, he should then bring near (by invocation) the gods, and address the water."

The gods, i. e. Dharma and the rest (*see above*).

That he should perform the (ceremonies), beginning with the bringing near of the gods and ending with the placing of the scroll (on the accused's forehead), this and the like (and) the verses addressed (to the water) must be looked for in the (description) of the manner of proceeding.

Vyâsa (says) :

"'By truth protect, O Varuna;' having conjured the water (thus), and taking hold of the thighs of the man who stands up to his navel in the water, he (the accused) should enter the water."

Xam means water; *abhiçāpya* (lit. having conjured) means having addressed.

Bṛihaspati (says) :

"When he has made the (accused) man enter the water he should discharge three arrows."

Pitāmaha (says) :

"The bow-man should be a Kshatriya or a Brahman, who follows his (a Kshatriya's) occupation, (who is) not hard hearted, of subdued passions, dressed and pure."

Kâtyâyana (says) :

When (the arrows) have been discharged, the submerging ought to take place, and at the same time the starting (to fetch the arrows.)

The meaning of the word *samakālīka* "at the same time," is that (it is to take place) at the same time as the submersion.

Nārada and Pitāmaha (say) :

"A young, swift man should go according to his utmost power from

the place of shooting to where the middle arrow (lies). Another man of the same qualities, having received the middle arrow, should quickly go back to the place, whence the (first) man came. But if the arrow-bearer, arriving, sees him not, and (he is) in the water, then he shall declare him to be cleared, otherwise he shall be guilty, though he may show only one limb, or if he has gone to another place from that where he entered before. 'One limb' means the ear.

And Kātyāyana (says) :

"Of whom he does only see the (top of the) head, and neither the ears, nor the nose, at his entering in the water, him also he should declare to be innocent."

Pitāmaha (says) :

"The (place where) the arrow falls is to be used (as the starting point for the second runner), and not a (place to which the arrow may have glided)."

Nārada (says) :

"Those two runners who are the swiftest among fifty, should be appointed there (at the ordeal) in order to bring the arrow."

Now (follows) the manner of proceeding.

The place of (the ordeal by) water (is described as follows).

A river, the ocean, a lake, a natural water-course, a pool or a tank and the like (places) containing quiet water, should be used. One should avoid a small or unclean (place), and one that is full of grass, reed, waves, mire, alligators, leeches, fish and the like, one which is quick-flowing and the like. There, in water which reaches up to the navel, a pillar for (fulfilling) the law should be made from a tree whose wood can be used at the sacrifice. Near this, on the western bank an arch, reaching up to the ear of the accused, should be made.

A bamboo bow of one hundred and six fingers length, and three arrows made of bamboo, without iron tops, should be placed near this. A target is to be placed on cleared ground, one hundred and fifty ells from the arch. Then after having worshipped the bow and the arrows with white sandal-wood and garlands, having brought Varuna (by invocation) to the water and worshipped him, and having completed the above described (ceremony), which begins with conveying of Dharma to the bank of the water and ends with the burnt-offering,

and having tied the scroll with the accusation to the forehead of the accused, the judge should address the water as follows :

“ O water, thou art the breath of living creatures, thou wast first produced at the creation, and thou hast been declared to be a means of purifying things and living beings, therefore show thy (power) in discerning between guilt and innocence.”

The person who is to be cleared also should address (the water) :

“ Through truth protect me, Varuna.” Then the accused should approach a very strong man, who supports himself by the pillar of the law, who has his face turned to the east and stands in the water up to his navel. Then a Kshatriya or a Brahmana, who follows his (the Kshatriya's) occupation, should vigorously shoot the three arrows without iron tops towards the target.

Then, whilst one swift man has taken up the middle arrow, and, having left the place where it rolled to (on the earth), placed himself on the spot where it fell, another swift (man) must stand at the foot of the arch whence the arrow was discharged.

And the swift (one) must be the swiftest amongst fifty runners.

Then, when the judge, who stands at the foot of the arch, has clapped his hands three times, the accused must submerge himself and the swift man, who stands near the arch, must begin to run very quickly. And the submersion has to take place by catching the thighs of the (man) who supports himself on the pillar of the law. Then when he (the first runner) has arrived at the place where the middle arrow fell, the man who stands there and took up the arrow runs very quickly towards the arch. If he finds the accused submerged, then he is innocent. He is also innocent, if the top of the head only is visible ; (but) not (innocent), if his ear or any other member is visible, or he has moved from where he had dived to any other place.

Now follows the rule for (the ordeal by) poison.

In (regard to) this, Nārada (says) :

“ A Brahman (the judge) with collected mind, turning his face towards the north or east, having fasted, should give the poison, before gods and Brahmans, after having worshipped Maheçvara with incense, food and Mantras, (to the accused) who stands before the Brahmans facing the south.”

The same declares the quantity of the poison.

"In the rainy season the measure is recorded to be four barley grains, in the hot season five, in the cold season seven, in autumn even less than that."

Less (means) three barley grains.

The cold season indicates also the dewy season, because these two (words Hemanta and Çiçira) are always used as a compound.

But the spring is fit (for this ordeal) because it is common to all ordeals.

Vijnâneçvara declares that the measure (of the poison) is also then seven barley-grains.

The poison should be given (mixed) with thirty times as much ghee. Because Kâtyâyana says, "but the poison should be given to men in the forenoon in a cool place, mixed with thirty times as much ghee, well pounded."

Yâjñavalkya (II. 110) has declared the address to the poison: "O poison, thou art Brahman's son, firm in the duty of (making known the) truth, save me, according to truth, from this accusation; become ambrosia to me."

Nârada (says):

"Sitting down in the shade, he must be watched the rest of the day, without taking food. Mann says, that if he overcome the force of the poison, he is innocent."

In case of excess of the measure of the poison the same ordains another interval of time:

If he remains healthy for 500 Pâlas (about 500 seconds), then he is innocent and may take medicine.

And the symptoms of (the working of) the poison (have been described) in the Vishatantra.

"The first attack of the poison causes the erection of the hair (on the body), (then follow) sweat and dryness of the mouth, after that arise (frequent) changes of colour, and trembling of the body. Then the fifth attack causes the immobility of the eyes, loss of speech and hiccougling. The sixth, hard breathing and loss of consciousness, and the seventh, the death of the person. There (at this ordeal) he (the accused) should take the poison, after it has been placed before Mahâdeva, by the judge, who has fasted."

Now (follows) the rule for (the ordeal by means of) water taken from the bath of a god.

Pitāmaha (says):

“He (the judge) should make (the accused) drink the water (from the bath) of that god whom (the accused) worships especially, but if he worships (all) the gods equally, he should make him drink (the water from the bath) of Aditya. Thieves and people who live by the sword, he should order to drink (the water from the bath) of Durgā; but he should not make a Brahman drink the water from the (bath) of Aditya.”

Bṛihaspati (says):

“The (bathing water of the god) whom the accused worships exclusively, is his (the gods) weapon; having sprinkled the god he should make the accused drink three handfuls of the water.”

Nārada: “Having called the accused and placed him in the circle (drawn at the beginning of the ceremony), facing the sun, he should make him who has bathed according to the beforementioned rule, is dressed in his wet garments, and is pure, drink three handfuls of the water.”

Nārada:

“Having worshipped that god (who is especially addressed at the ordeal), and sprinkled him with water, and told (the accused) the (greatness of the) sin (in case he lies), he should make him drink three handfuls (of the water).”

There (at this ordeal) the judge, having fasted (from sunrise) and worshipped the god in the forenoon, and having taken (the god's) bath, and performed (the ceremonies) beginning with the bringing near of the gods and ending with the placing of the scroll on the forehead of the accused, should address the water with the Mantra prescribed at the 'ordeal by water.' Likewise should the accused address the water with the formerly-mentioned (Mantra), and then drink afterwards.

Bṛihaspati (says):

“He who does not suffer any misfortune in regard to children, wives or property within a week or a fortnight, shall doubtlessly be (considered) innocent.”

Now (follows) the rule (for the ordeal by) rice grains.

In regard to this Pitāmaha (says):

"I will declare the rules for the (ordeal by) rice grains, as it is described by its particular characteristics; but the maxim is, that the ordeal by rice grains should be allowed in case of theft only, not otherwise."

He should order grains of Çâli, not of any other (kind of rice), to be made white. Unsullied (by impurities) he should expose them in an earthen vessel to the sun, and should keep them mixed with water from the bath (of the god) for one night, and should perform the ceremonies beginning with the bringing near of the gods according to the rule during the night."

Kâtyâyana also (says):

"At the eating of rice grains mixed with the water of the god's bath, he (the accused) shall be considered clean, if he spits them out clean (not mixed with blood, etc.); he (who does) otherwise (is) guilty, and should be punished."

Pitâmaha (says):

"He should declare that man guilty, who is seen to bleed, whose jaw or palate is torn, or whose body trembles."

Now (follows) the rule for (the ordeal) by hot mâsha—grains (made of metal).

Pitâmaha (says):

"I will declare the rule for (the ordeal by) hot mâshas (which is) good for (the judge) clearing (men). He should have made an iron or copper vessel of sixteen fingers (in circumference) and four fingers deep, or an earthen round (vessel). He should have it filled with clarified butter and oil (to the weight of) twenty palas. Then he should place into it, (when it is) well-heated, a golden mâsha—grain. (The accused) should take out the hot mâsha, with the thumb and (first) finger. If he does not move the ends of the fingers, or no blister comes, he whose fingers are not hurt is (considered) innocent according to the law."

The same describes another mode (of undergoing this ordeal). Being pure, he (the judge) should order clarified butter prepared from cow's (milk) to be heated in a golden, silver, copper, iron or earthen (vessel), and he should throw a beautiful golden, silver, copper or iron coin, which has once been washed with water, into the (liquid). When it is full of small and great gyrating waves and cannot be touched with

the nails, then he should examine it on a wet leaf, whether it makes loudly the sound *Churu*, and then he should address it once with this Mantra :

“Thou, O ghee, art the best means of holiness, and ambrosia at the sacrifice ; O purifier, burn thou the bad man, be cool like snow to the innocent.”

Then he should make (the accused), who must come, after having bathed, in wet clothes, without having eaten or drunk, take that coin which lies in the ghee. The examiners (Brahmans appointed thereto as in the ordeal by the scales) should examine his first finger. If there are no blisters, he is innocent, otherwise guilty.”

Now follows the rule for (the ordeal by) the ploughshare.

Bṛihaspati (says) :

“The ploughshare must be made of iron, twelve palas in weight. Eight fingers be its length and four its breadth. A thief should once lick strongly that with his tongue, when it is heated to the colour of fire. If he is not burned, he shall be innocent, otherwise he is guilty.”

Now (follows) the rule for the (ordeal by) lot.

Pitāmaha (says) :

“Now I will declare the examination of murderers, persons who raise (unjust) claims, and of persons who refuse to perform a penance for a crime of which they are accused, by means of (lots bearing the figures of) Dharma and Adharma. He should cause to be made (one lot) of silver, bearing the figure of Dharma ; and one of lead, bearing the figure of Adharma ; or he should draw on (two) pieces of the inner bark of the birch-tree Dharma and Adharma in white and black. Having sprinkled (the two lots) with the five products of the cow, he should worship (them) by presenting sandal-ointment and flower-wreaths. But to (Dharma) white-flowers (should be presented), and black flowers to Adharma. Having performed this and smeared (the images with cowdung), he should place the two (lots) in two heaps (of cowdung). The two heaps must be made round, of cowdung or (clean) earth, and must be placed in a new earthen jar, without being marked. In a clean place, smeared (with cowdung) in the presence of (the images of) the gods and of Brahmans, he should then bring near the gods and the guardians of the points of the horizon, as formerly (described). But before bringing Dharma near,

he should write the Pratijnâpatra, (a paper declaring the resolution of the accused to perform the ordeal and the crime of which he is accused.) Then the accused (saying,) "if I am free from guilt, may (the lot of Dharma) fall into my hand," should take one (of the heaps) without hesitating. If he has taken "the lot of Dharma" he shall be cleared, but if he has taken the lot of Adharma, he loses his cause. Thus has been declared in short the examination of by the two (lots symbolising) innocence and guilt."

• Brihaspati (says) :

"Figures of Dharma and Adharma must be drawn on two leaves (in) white and black. Having addressed (Dharma and Adharma) with the verses which convey life to them and others, and with the Sâma-melodies beginning with the Gâyatri, he should worship them with perfumes and white and black flowers. Having sprinkled them with the five products of the cow and placed them into two heaps of earth, and made (the heaps) equal in size without marks, he should place them in a jar. Then (the accused) should take one heap out of the jar without hesitation. If he has taken "the lot of Dharma" he shall be considered free from guilt, and is to be honoured by the persons conducting the ordeal.

Now (follows) the manner of proceeding.

Having drawn a white figure of Dharma and a black figure of Adharma on two leaves, and having given life to the image of Dharma by this (mantra) : "Am, hrîm, krôm, ham, yam, ram, lam, vam, çam, sham, sam, ham ; I (am) he (Brahma) ; may breath come here (to this image) and remain long and happily, Svâhâ ;" he (sings) the Sâmans beginning with the Gâyatri-sâman if he knows the Sâmans.

(Then) he again pronounces this Mantra (Am, etc.) (and substituting for the word Dharma's breath, etc.), "Dharma's soul is here." (Afterwards) he pronounces the same once more, substituting for the words "Dharma's breath," etc., "Come hither, Oh mind, Oh eyes, Oh ear, Oh nose, O breath, (come hither) all ye organs of Dharma, remain here, Svâhâ !" Having thus given a soul to the image of Dharma, and having uttered the Gâyatri-sâman, if he knows the Sâma-melodies, if not, the Gâyatri-verse preceded by Vyâhritis and the syllable Om, he performs the ceremony of bringing near (the gods) and the rest. Having honoured the (images of) Dharma and Adharma in their order

with white and black flowers, and having taken the five products of the cow, (pronouncing) the syllable Om, and sprinkling (the images), he lays each of the images, Dharma together with white flowers and Adharma together with black flowers, into a heap of earth and places (these two heaps) in a new jar. The judge then performs the ceremonies beginning with the bringing near of Dharma and ending with the burnt-offering, prepares a Pratijñapatra on which also the Mantras are written, and ties this leaf to the forehead of the accused. The accused saying, "If I am pure of guilt, may (the image of) Dharma come into my hand," takes one of the two (heaps) in the jar. If he has taken the image of Dharma, he is to be considered innocent. Afterwards he should give a present (to the Brahmans).

Now (follow) the oaths.

Mann : "Let the judge make a priest to swear by his veracity ; a soldier by his horse, or elephant, and his weapons ; a merchant by his kine, grains and gold ; a mechanic or servile man by (imprecating on his own head if he speak falsely) all possible crimes."

Bṛihaspati (says) :

"In small causes oaths by (the accused's) veracity, vehicles, arms, kine, grain, or gold, by the feet of the gods or Brāhmans, by the (accused's) sons' or wives' heads are prescribed, but in accusations of crimes attended with violence the other ordeals are declared to be the means of proving (the accused's) innocence."

Yajnavalkya (says) :

"He shall be considered innocent, without doubt, to whom within a fortnight (after his taking the oath) no dreadful misfortune, caused either by the king or the gods, happens."

Dreadful (ghora) means great, because a small (misfortune) is unavoidable for men ; thus (it is written) in the Mitāxarā.

Katyayana also (says) :

"He, to whom within a fortnight no dreadful misfortune from the king or from gods happens, is to be considered cleared by the oath." Vyāsana means âpat, misfortune. Ghora (dreadful) means exceedingly painful, because small (misfortunes) are incidental to all creatures possessing a body.

Again Kātyâyana (says) :

"But now, if a misfortune coming from god happens to the accused

within a fortnight, he (the judge) should anxiously make him pay the property (disputed) and also a fine,—if (the misfortune) befalls him alone, and not all the people (at the same time). Sickness, a conflagration (of accused's house, etc.), the death of relations, heavy fever, eruptions, and deep-seated pains in the bones, disease of the eyes or of the throat, madness, disease of the head, and the breaking of an arm, are the diseases which befall men, (coming) from god." Misfortunes coming from the gods (are) such as the death of relations. By the (words): " (If it befalls) him alone," epidemics, such as cholera (mâri), are excluded. As in this (passage) by the (word), "his" the before-mentioned accused is referred to, sickness and the like are a sign of a false (oath), only (if they befall) the accused, and not (if they happen) to his sons or other (relations). And such (illness) ought, as before mentioned, to be grave, not trifling. With reference to this (last point) Vâcaspatimiçra (gives us) the meaning (of the passages):

"Uncommon sickness (which befalls) the accused is a sign of a false (oath). Therefore it is also declared that the death, not the sickness, of relations (is a sign of the accused's perjury)."

Rough Notes on some of the Antiquities in the Gayá District. —

By W. PEPPE, Esq.

[Received 20th November, 1865.]

About 11 miles from Gayá, on the Patna road, there is a small village and bazar called Newree; on the right of the road there is a small temple on a mound with one or two large peepul trees round it. There are several figures lying about, and there is a slab on the pukka terrace of the temple, representing a prince on horseback with attendants, one holding an umbrella or chatta over him; others are carrying various articles; one has two vessels slung on a pole, much in the same way as pilgrims now carry the Ganges water; another has a pig on his shoulders, as far as I can make out; it would seem to represent some notable person performing a pilgrimage, (see Photograph, 9 a.*) and may have been executed to commemorate the pilgrimage of some prince. The villagers state that this slab has only been in its present place but a short time, and that it was found in a village about a mile to the

* The photographs alluded to in this paper may be seen in the Asiatic Society's Library.—Eps.

east, but it most likely came from the Burabur hills, which are only 6 miles from here.

The little temple or "Muth" is about 100 years old, and is said to have been built by a Mussalman Zemindar, a singular instance of toleration, if true.

Bela.—A mile further on is the village of Bela; there is a dak bungalow here, and it is the point where the main road is left by visitors going to the Burabur hills.

To the north of the village are extensive mounds of brick rubbish, several large tanks and the ruins of several temples (judging by the number of Lingams) dedicated to Mahadeo; they lie to the east of the large mound, through and over which the main road lies. To the south of this there is a modern temple dedicated to Kalee, built by the Tikaree family, in the Adytum of which there are a number of figures, principally in fragments: there are several of a Buddhist character.

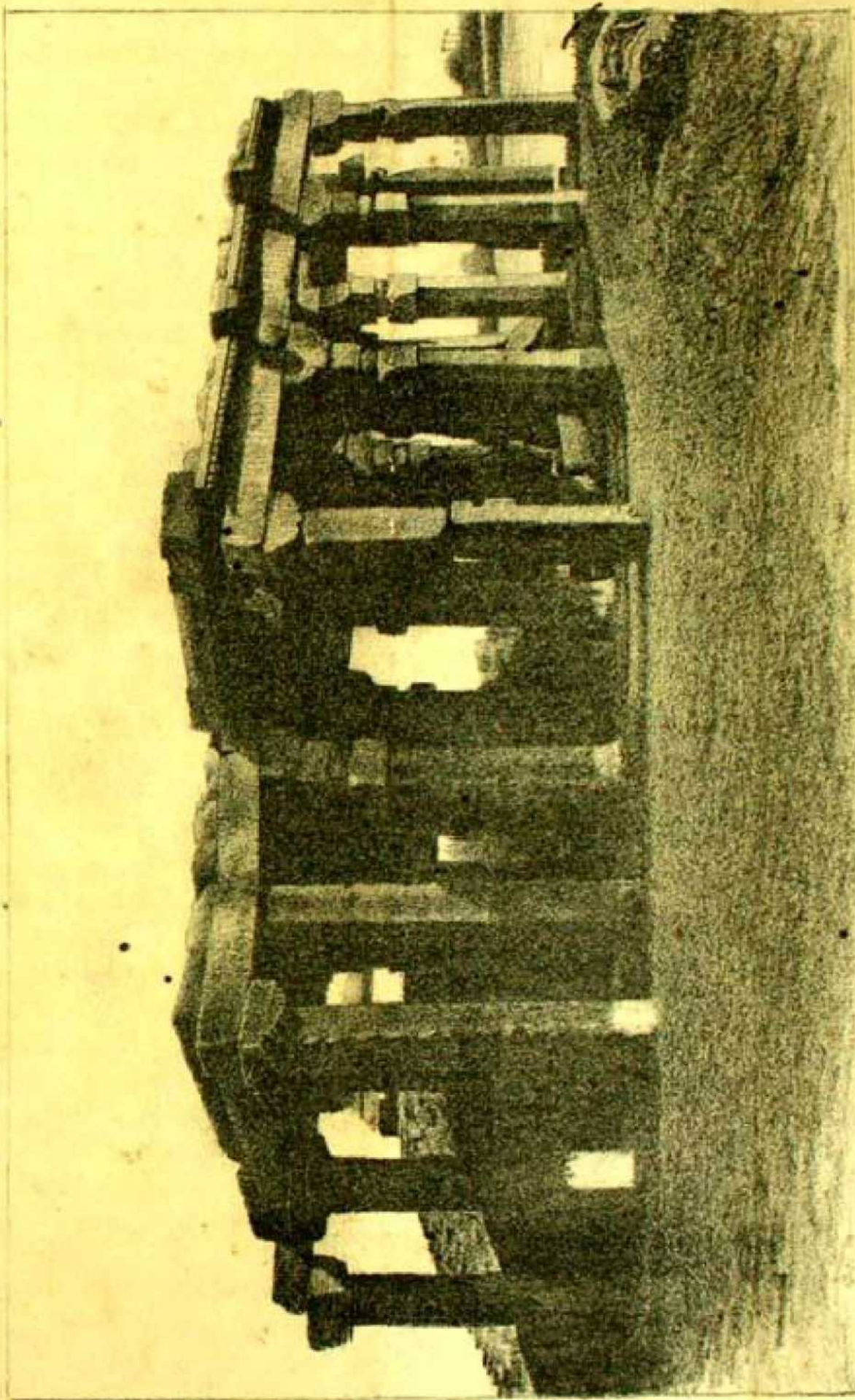
Palee.—About two miles further on at a village called Palee, there is a large tank, now nearly filled up, to the north of which there are several life-sized figures standing on the road side, but of no interest, and of the kind so very common in this district.

Nair.—About four miles further on is a village called Nair; to the east of the village through which the road runs, is the ruin of a temple, with the pillared portico still standing; (see Photographs Nos. 10 and 11, Plate I.) The pillars are of granite in one block; the temple itself would seem to have been of brick, but is now only marked by a mound of brick rubbish: its internal chamber is still standing, and now contains a lingam.

There are several statues lying about, mostly in a mutilated condition, but none of them are of much interest. There are several large tanks in the neighbourhood, both to the east and west of the road, with several lingams in situ.

Returning to Bela and leaving the Patna road there, after going about six miles to the east, is the isolated peak called Kowa Dhol, but as this has been so fully described both by Major Kittoe and Col. Cunningham, I need only describe the photographs from this and adjacent localities.

No. 12. View of Kowa Dhol from the east, showing the site of the ancient village on the right.



Drawn on Stone by Mr. W. H. Niven, Das Shikhar, Govt. School at Ajit, Calcutta.

PILLARED PORTICO AT NAIR

Lat. by H. Niven 3 G. O. Calcutta May 1866

No. 13. The Gigantie Boodh mentioned in Col. Cunningham's report.

No. 14. A view of the Great Gurha caves, showing the entrances to the Lomas Rishi to the right and the Ladama cave to the left, and the huge block of granite, out of which they have been chiselled at the expense of so much labour: the crack or flaw in the rock which arrested the work in the Lomas Rishi is also seen to extend to the outside.

No. 15. A new view of the entrance to the Lomas Rishi cave, showing the frieze of elephants, the drawing of which will bear comparison with that of the best artists of the present day.

No. 16 is a view of the Nagarjun hill, with door-way and ascent to the Gopi cave.

No. 17 is a view of a huge boulder supported by others, forming a natural cavity or grotto which had been built up into a small chamber or cell; the only part of the work now remaining is the mass of brick rubbish on the top, which has been kept in its place by the roots of the plants growing out of it. It is immediately alongside of the Vapiya caves, a view of which I did not obtain.

Proceeding on to Durawuth—

No. 18 is a view of the Dandoker Tal from the north-west, showing the little temple on the bank of the Tal and the hills in the background.

Nos. 19 and 20 are views of the twelve-armed figure mentioned by Col. Cunningham; I have only met with one other example of this figure.

There are several figures and sculptures of interest in this neighbourhood; one is a seated figure of Boodh, surrounded by a seven-headed snake; it is called Nagjee by the natives. I also found several slabs with quaint representations of the worship of the solid temples or chaityas, see Photograph No. 21.* These came originally from the small hill to the south of the tank. These little hills have been covered by little buildings, the character of which I have not been able to make out; I counted some 15 or 16 on one little hill; they were mostly built on the highest peaks and also crowned every projecting spur; all that remains of them now are small platforms of rough stones and mounds of brick. What their outward forms were, cannot now be guessed, nor for what purpose they were built; but most probably they were cells for the abode of recluses. I have met

* The base of pedestal of a figure of Buddha, has the creed in Kutila characters.

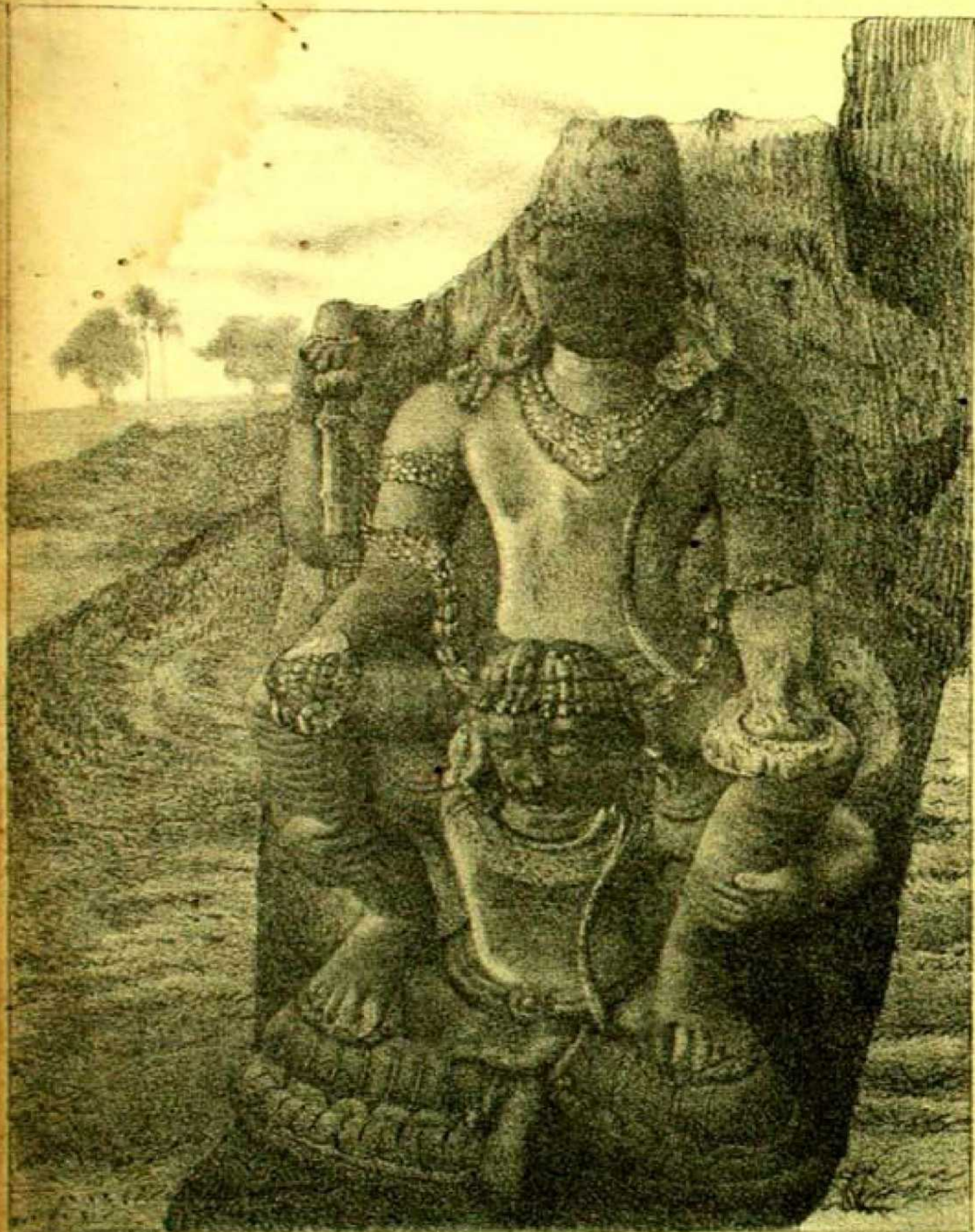
with these little buildings in several localities, and will refer to them again in noticing those I found in better preservation at Cheon.

Genjun.—Referring to the map,* you will see that there is a village called Genjun, about 6 miles distant, west of the Patna road, in a direct line with Durawuth. There are very extensive mounds at this village, and several large and interesting figures, one of which is represented in No. 22. It is well executed and, with the exception of the fracture, in good preservation; the figures surrounding the Boodh are representations of events in the life of Sakyā Singha, with the Nirvan at the top. The figure is called Byro by the Brahmans of the village. The pedestals of several large figures as well as the lintel of a sculptured Buddhist doorway have inscriptions, but they are defaced, from the villagers having used them as whet-stones. I was informed that these figures were exhumed when the mounds were dug into for the erection of a small mud fort which adjoins these mounds: no doubt these mounds are the sites of large buildings, and their excavation would bring to light many other interesting figures.

To the north-east also a number of figures have been collected in a small brick enclosure, but they seem to be of more modern date; a figure of Gunesh is the principal one.

Kispa. About two miles to the south-west is a village called Kispa, where there are some very fine life-sized figures; one in the middle of the village to the east is a fine standing figure of Boodh, in capital preservation, with an inscription; near it are slabs and pillars of granite shewing that a temple had existed at this spot; the whole village stands on high ground formed of brick rubbish. To the south of the village are extensive mounds, and to the north of this there is an old mud fort. On the west side of the ditch surrounding the fort there is a twelve-armed figure, the same as the one at Durawuth, and has evidently been found when digging the fort ditch. Close by these mounds, to the south, is a small temple dedicated to Tara Devi, and a number of figures are collected in and around it; the temple itself is of the common kind seen in every village. Tara Devi is a standing figure of a Buddhist character, but it was so covered by drapery, that I could not make it out. A little to the north of this temple, and on the opposite side of a ditch cut as a water-

* Preserved in the Asiatic Society's Library. Eds.



Drawn on Stone by Kriate Haris Das Student Govt. School of Art Calcutta.

STONE FIGURE AT GENJUN.

Lith. by H. Niven S. G. O. Calcutta May 1866.

course by the villagers, is a very singular figure, and the only one of the kind I have hitherto met with : see Photograph No. 22½ (Plate II.) It represents two figures, life-sized, one seated on the shoulders of the other. From the ornaments and style it is evidently Buddhist, but I am completely at a loss as to its meaning. To the north of the village, there is another little temple in a mangoe grove, with a number of figures, more or less mutilated, collected around it. I noticed a nicely sculptured Lingam of a square form, and the only specimen of the kind I have met with.

Kutangee.—About five miles west of this place is a village called Kutangee. There is in it a large mud fort of some pretensions, and numerous mounds of brick rubbish, some figures in fragments, but none of any interest.

Mujheawan.—About a koss further north, there is another large mud fort at the village of Mujheawan, and nearly every village about this have mounds and small mud forts, but I saw no figures of importance or interest.

Kyal.—About eight miles west of Mujheawan, there are large tanks and mounds, but no other features of importance.

Deokund.—South of Kyal on the borders of an extensive tract of land covered with shrub jungle is a place called Deokoond, which seems to have possessed a Buddhist temple or monastery. There is a fair held here in the month of Fagoon, when great numbers of people assemble to bathe in the tank or koond. On a former visit, I observed a number of broken Buddhist figures and miniature stupas collected under the trees : these have since been covered with a coating of mud. The temple itself is in the centre of a mass of brick rubbish, through which a road has been cut to give access to the interior chamber which is now occupied by a Lingam. A rude sort of dome has been erected immediately over the central chamber. See Photograph No. 23.

No. 24 is the gateway of a fortified serai in the old village of Daoodnuggur, so named from Daood Khan the founder, who died some 200 years ago.

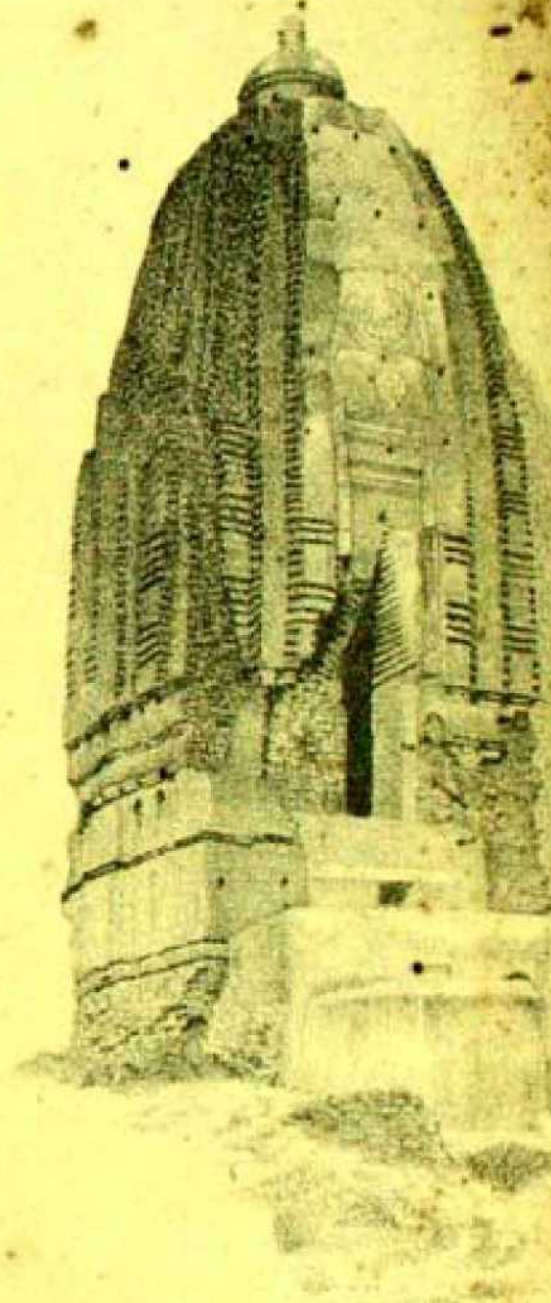
Konch.—On the road between Daoodnuggur and Gayá, about 16 miles from the latter, is the village of Konch ; I have already noticed the temple at this place, but the following notes may not be unacceptable. The present village consists of two parts, the bazar on both sides of

the road, and the village proper, which is about 100 yards to the north of the road. Between the two villages there are several extensive mounds of brick rubbish, and a number of scattered Buddhist figures. On the right there is an old mud fort, and it would seem that in digging the mud for its erection, the larger figures were found; the principal one is life-size, highly finished, but wanting the head; see No. 25. This is placed upright on a level with the path. Higher up on the mound to the west are the Buddhist figures with inscriptions shown in Photograph No. 26. To the south are two figures (see Photograph No. 27) of the form I have already referred to, as being the most general all over this district, and which are named according to the fancy of the Purohit, who, provided with a few of these figures only differing in the execution, has the range of the whole of the Hindoo Pantheon, and names them at his own discretion, or according to the wishes or wants of the community.

Passing through the village proper, you come to the temple mentioned by Buchanan, and of which a drawing is given in the first volume of Martin's India. Photograph No. 28 (Plate XII) is a view of the front of the building from the east with the opening above the entrance, leading into the upper chamber. Photograph No. 29 is a view from the southwest. The accompanying ground plan (Plate III) will give the reader some idea of its structure, and the section will show the superstructure with the arched lower chamber, and the interior recess over the entrance which resembles that in the Boodh Gayá temple. Nothing but mud has been used to cement the bricks, but the latter have been so well prepared that they fit together most accurately. There would seem to have been a coating of plaster on the outside, but this has nearly entirely disappeared. A porch had been added with an arched roof, but it has fallen in, the only arch in the original building is that of the lower chamber which is painted.

In the centre of the lower chamber there is now a lingam, and in the porch there are a number of figures. Photograph No. 30 is a slab let into the wall with a representation of the avatars. Photograph No. 31 are other figures in the same enclosure. Photograph No. 32 is a nearer view of the entrance and opening above the doorway.

Immediately outside, there are a number of granite pillars, and from their number and situation, they seem to have formed an enclosure round the temple.

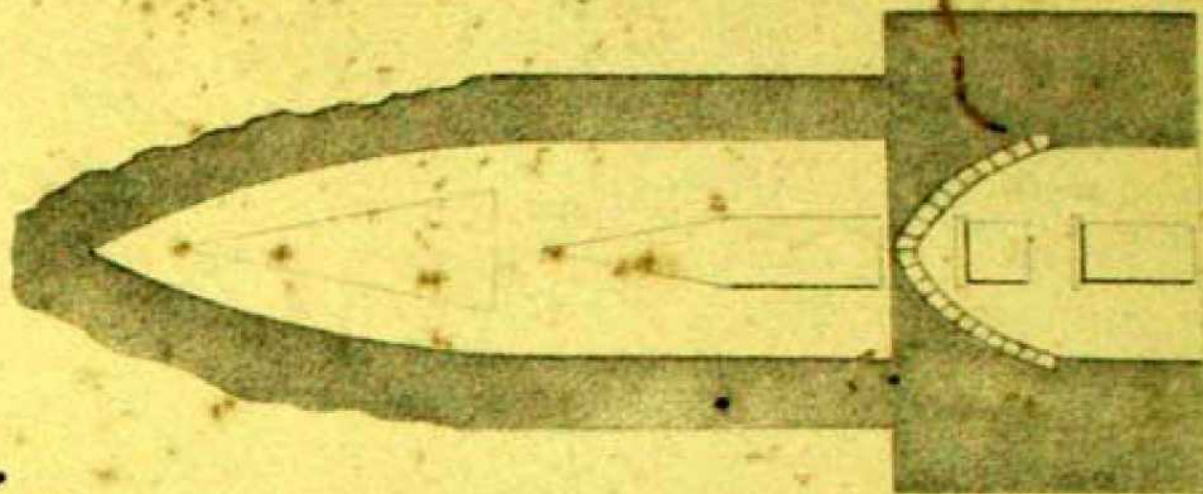


TEMPLE OF KONCH FROM A PHOTOGRAPH BY J. H. PEPPE, ESQ. '85

Drawn on stone at the Govt. School of Art Calcutta by Kristoharry Dass Student.

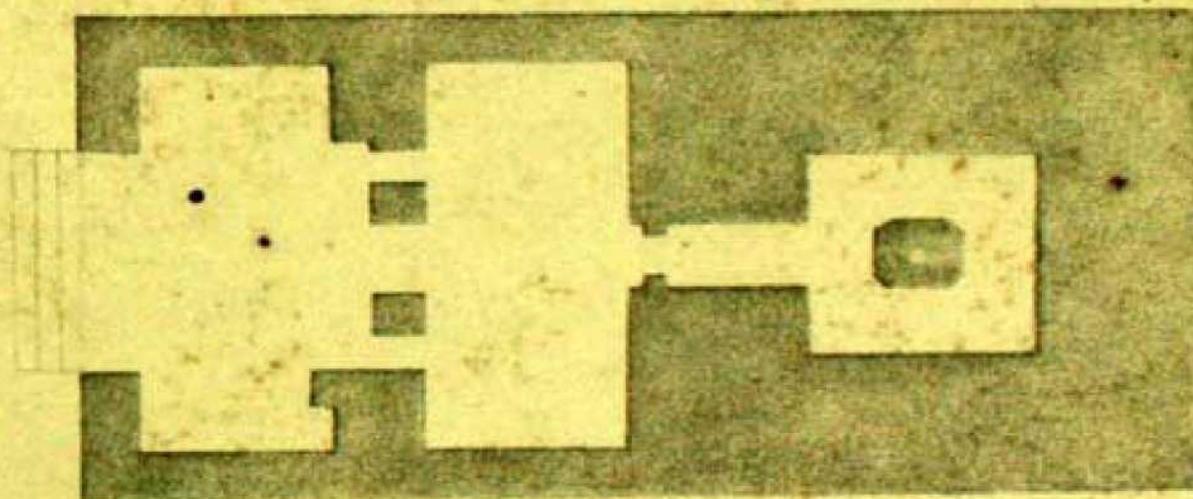
LITH. BY W. M. SMITH, SURVEYOR GENERAL'S OFFICE CALCUTTA MARCH 1886.

ROUGH SECTION OF TEMPLE AT KOCH



Scale
Feet 0 1 2 3 4 5 6 7 8 9 10

PLAN OF TEMPLE AT KOCH



Scale
Feet 0 1 2 3 4 5 6 7 8 9 10

In a corner of the village near the temple, there are a great number of lingams collected, of all sizes, many with 3 and 4 sculptured faces. To the east of the temple there is a small tank; on the banks there are several sumadhis or tombs, of the form which is so common at Boodh Gayá.

Palee.—Four miles nearer Gayá is another village called Palee, which seems to have had several temples; one at least was Buddhist, and of the same form as the one at Nair and at Poonawa. Judging by the few pillars still standing (see Photograph No. 33,) a great number of pillars have been removed. When I last visited the place, quarrying for bricks was being actively carried on. Several large lingams had been dug out of the mass of rubbish, and also a bull of the usual form, so that the temple, which was most likely originally Buddhist, had subsequently been converted into a Hindoo one. A few paces to the west close to the road there is a large lingam in situ, with a peepul tree growing in the interstices: see Photograph No. 34. Close by is the lintel of a Buddhist temple door, and the side posts are a little distance apart under a peepul tree: see Photograph No. 35. For some distance round there are traces of temples, but those described seem to have been the only ones of any size.

Almost directly south from Konch is a large village called Kabur, and adjoining it is a rather large fort marked Mudun in the maps, but I could find no local name for it. From the extensive mounds in every direction, and the appearance and size of the fort, it is of much earlier date than the generality of the mud forts so common in this district. It is attributed to the Kole Rajahs by the natives, and this is the case with everything which is earlier than the advent of the Mussulmans. I was disappointed in not finding any figures or inscriptions in the neighbourhood. There are one or two pillars of black chlorite which must have belonged to some old Hindoo Temple, but the natives informed me they had been collected for the building of a mosque by some former inhabitant of the village. There is a granite stone, itself originally a part of a pillar, inserted in a large well, but which has proved to be the dedication of the well by some obscure individual: see Photograph No. 36.

About 6 miles to the south-west is a large village and bazar called Chirkawan; it is the principal place in the Pergunnah of that name. It

is built on the site of an ancient village, and there is an old mud fort adjoining. A large tank to the south-east of the village has a stone pillar in the centre, but with no inscription; it is one block of granite rudely sculptured, and is now only about 10 feet above ground. Another pillar of the same kind occurs at a village called Belar, with extensive mounds about 5 or 6 miles to the south. Two miles to the south, there is a cluster of small detached hills at the foot; almost easterly there is a village called Cheoñ (pronounced Cheo). To the east of this village, on a small eminence, there is a ruined temple still partly standing: see Photographs Nos. 37 and 38: the first shows the appearance of the temple from the south, and the second gives a nearer view of the doorway. The temple is built of squared granite blocks, with little cement or iron bands, and is evidently of the same age as those at Oomga. There is a lingam in the interior, but no other figures, and there are only a few figures about. I failed in finding any inscriptions.

Some little distance to the north, near the hill, there are several large figures all more or less mutilated, and a great number of squared granite blocks, from which it would seem that another temple existed here; and the base of the hill on the west, north and east, is covered with brick rubbish in mounds of more or less distinct shapes. The hill runs down into a low spur on the west side, and every available spur and ridge had been covered with buildings. Some of the mounds to the south are both large and high, so that there is little doubt that this must have been the site of a considerable settlement in former days; and that it was a Buddhist community, may be inferred from the prevalence of figures of a Buddhist character.

To the west is another little hill called Puchar, which is also covered with the remains of little buildings; and on the south side, half way up, there is a small cave temple with the doorway and passage still standing: see Photographs Nos. 39 and 40. The doorway is supported on pillars with the usual bracket capitals, and the roof of the passage is made with slabs of the same granite. The cave is only some ten by twelve feet, of an irregular form, as it is a natural cavity between the huge boulders, with some addition in the shape of a few bricks to close up the interstices; one of these communicates with other cavities in the hill, as a strong current of air was found to be passing into the interior, so much so that a light was extinguished, but as the opening

was so narrow, there could have been no cave beyond, else it would have been widened. The roof is a boulder supported by others at each side.

There are several fragments of images, but only two are perfect; one is a seated figure of Boodh about 3 feet high, but it is partly imbedded in the accumulation of rubbish on the floor; it has the same canopy of a seven-headed snake which I observed at Durawut, where it is called Nagjee; here it is called Langa-beer! The other figure is a female, one which, Bábu Rájendralála Mitra says, represents Máyádeví, Mother of Boodh.

Outside, there is a small platform, in front of the entrance, of undressed stones, and a series of rude steps leads up from the foot of the hill. I may mention that there is a story current amongst the natives here, that a party of strangers arrived at this place, ostensibly as a marriage procession, that they encamped at the foot of the hill, and that in the night time they dug up a quantity of treasure which had been buried at the foot of a large detached boulder: the hole which they had dug was pointed out. They say that they were Coles or people from the South, and it was explained that these people were formerly in possession of this part of the country, and this was how they came to know that there was treasure buried here.

About a mile to the north there is another little hill which was originally crowned with a temple, judging by the number of squared granite blocks which lay strewn about, and by the stones made use of in erecting a Durga over the tomb of some Mussulman Saint.

To the south of Cheoñ, at the distance of a mile, there is another cluster of hills; the nearest village is called Deokillee; the easternmost pinnacle of the hill is crowned by a mass of brick rubbish. In the centre of this mound, facing the east, the internal chamber is intact, but the entrance was nearly blocked up. By dint of squeezing, however, a native managed to get inside, but there was no figure; the little chamber was only some 10 by 12 feet long, but the rubbish filled it to within two feet of the roof, so that it is possible there may be some figures buried in the rubbish. To the north on the same space of the hill is a small cavity amongst the boulders which had been built up and thus formed a small chamber, and in front there is a natural basin in the rock which had been added to, and thus formed a

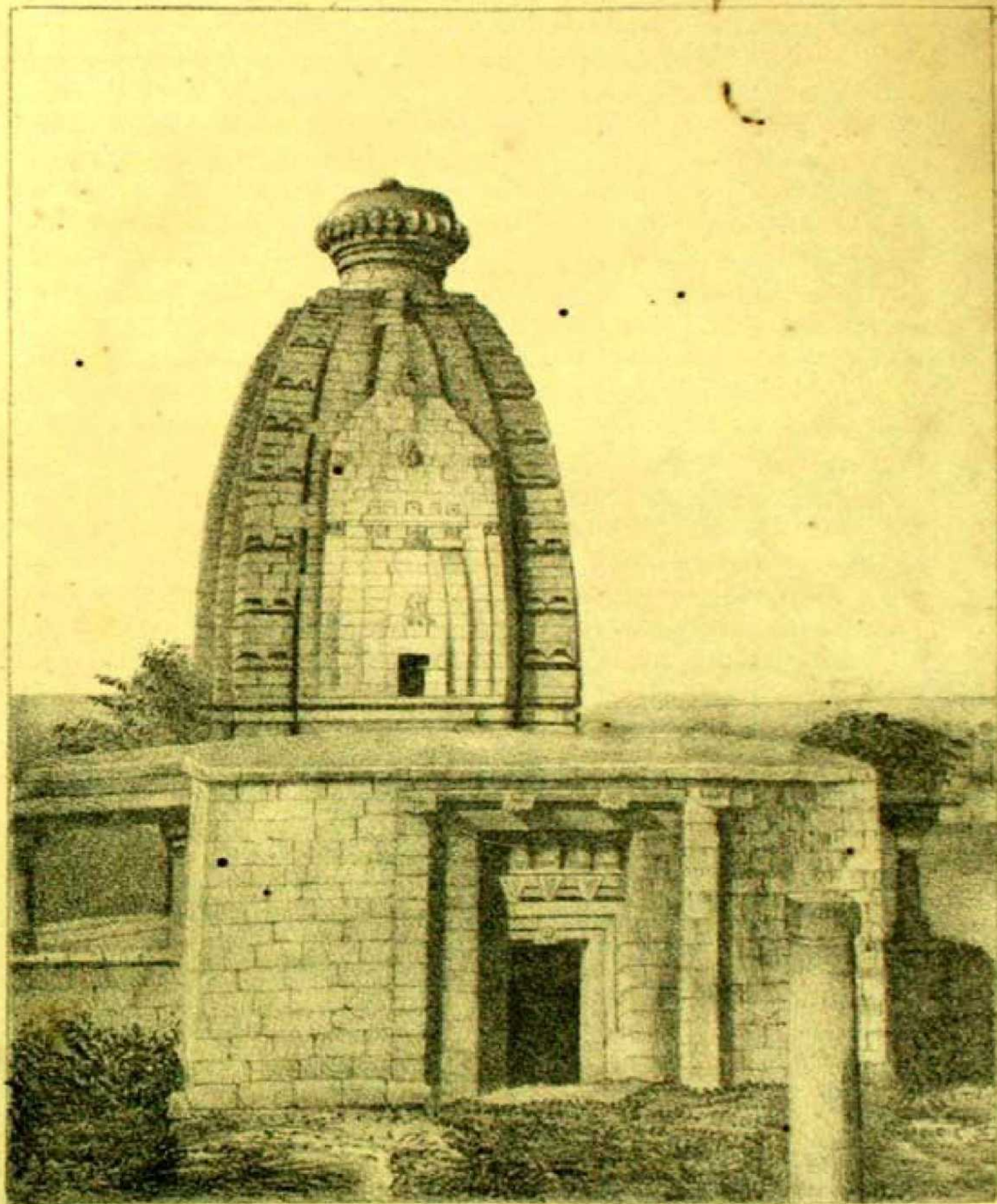
small tank or reservoir. Lower down on the north side there are two more of these cavities ; in both cases the doorway is formed of granite pillars with bracket capitals,—the entrances are blocked up with rubbish. There are several others on this side of the hill, and on the connecting spur between this hill and the next, there is a small temple or altar, with a roof of granite slabs supported by 6 granite pillars with bracket capitals ; there seems to have been a superstructure of brick, but very little of this now remains ; there are no figures or inscriptions from which the age may be deduced, but it is probable that they were Buddhist, for the style is exactly the same as at Cheon in which Buddhist figures are found, and it is most likely that all these hills, and also those at Durawut, were the abode of numerous Buddhist ascetics, and Fa-Hian states that the hills at Raggae contained several hundred grottos inhabited by devotees.

Some distance to the south-west there is another cluster of hills, and near a village called Chain there are several very large mounds covering several acres, and great numbers of granite blocks are lying about in every direction, but there are no figures or inscriptions, and it is quite impossible to guess at the age or description of the buildings which must have existed here. At the mouth of a small valley, partly where it runs into the plain, a dam had been erected for the water.

About four miles west from this is a large village, called War. There are extensive mounds to the south of the village, and there is a mud fort with a pukka citadel in rather good preservation ; the wall is of brick, loop-holed all round ; a range of rooms runs round the enclosure ; and underneath there is another range of rooms evidently intended as store rooms and as a refuge for the families of the garrison during an attack.

About five miles to the south-east is a small village called Mudunpur, on the Grand Trunk Road, and near it, about a mile and a half to the west, on a spur of the hill is Oomga temple, which has already been described by Major Kittoe in the 16th Vol. of the Asiatic Society's Journal. Photograph No. 41 (Plate IV.) will give some idea of its appearance from the south, and of the rock on which it is built ; the temple faces the east. See Photograph No. 42, which shows its front.

Higher up and on the same hill is another temple, but now in ruins : see Photograph No. 43. Scattered all over this hill and the adjoining



Drawn on Stone by Private Hari Loh Student, Port-School of Art Calcutta.

OOMGA TEMPLE *

Lith. by H. Niven S. G. O. Calcutta May 1866

one, are a great number of little temples and altars, all of them built of dressed granite, and a great profusion of figures, principally of Gunesh and lingams, of every conceivable shape and size. There is an entire absence of Buddhist figures, which shows that these erections are of a more recent date. From the translation of the long inscription given by Major Kittoe, it would appear that the temple was erected A. D. 1439. The Bamboos, which he bewails as having all died off, have sprung up again, and are as vigorous as ever.

Deo is distant about 10 miles from this. To the south-west the temple has a very strong resemblance to the Oomga one: see Photograph No. 44. It is of much the same size, and in capital preservation.

The village of Poonawa, visited by Col. Cunningham, is about 14 miles from Gayá to the eastward, on the Nowaderle road. Photograph No. 45 is a view of the pillared temple from the north-east. There is a strong resemblance between this temple and the one at Nair. The door is a very finely sculptured one (see Photograph No. 46), and is almost a facsimile of the one at Palce: see Photograph No. 35.

At Koorkihar there are a great number of figures; the principal one is a Boodh with representations of events in the life of Sakya Singha round the margin (see Photograph No. 47), but it is much inferior to the same figure at Genjun, (see No. 22.) No. 48 is a group of figures outside the little temple to the north of the village.

The remaining photographs are from Rotasghur in Shahabad. No. 49 is a distant view of the palace from the east side of the ravine. No. 50 is the elephant gate or principal entrance to the palace from the court-yard.

No. 52 is a view of the Mansoleum over the tomb of the chamberlain of one of the former Governors.

No. 51 is a view of the interior of the Palace.

Gayá, 9th November, 1865.

Mr. E. B. Cowell has sent to press the Yoga Aphorisms of Patanjali, with the commentary generally ascribed to Vyāsa. The work, we understand, is to appear under the auspices of the Sanskrit Text Society.

Major Henry Dixon, H. M.'s 22nd Reg. M. N. I., has just published a large quarto volume containing Photographs of 113 Canarese and 10 Sanskrit inscriptions. They are from the districts of Chittledroog, Davenghiri, Hurrihur, Ballagamee, Taldagundee, Sooroob, Annantpur, Shemogah, Taicul, and Beygoor in the Mysore Territory, and contain records which will prove of great interest to the historian of the Indian peninsula. The Canarese inscriptions are taken mostly from Sati stones of the Saiva period, and a number of them have the figures of Siva and his attendants carved on the top. The Sanscrit ones are title deeds of grants of land made by the former princes of Mysore, Canara and the Carnatic. We hope some enterprising scholar in Madras will, by translating these records, render them accessible to European scholars, and Major Dixon will meet with sufficient encouragement from the Government of Madras and the public to rescue from the ravages of time other documents of the kind of which there are a great number in Mysore.

The following is an extract from a letter from Dr. R. Rost of London.

"I mean to take an early opportunity of drawing attention to some rare Sanscrit MSS. in our possession, which are in Grantha characters, and have never been looked into. Amongst them are the Rik, White Yajur, Sāma and Atharva Vedas; Kumārilā, Mīmāṃsātantravārtika, the Sāṅkhya Saptati with commentary (2 copies), the Mayūkhamālikā on the Sastradīpikā, Mananam (Vedānta), and Bharata's Nāṭya S'āstra. Of the last mentioned work, there are several copies in the Brown collection at Madras; but all of them being, like our copy, in Dravidian characters, they are sealed books to the intending editor, Mr. Hall. We have altogether nearly 200 Sanscrit MSS. in the Grantha character. I wish Mr. C. P. Brown had deposited his large collection of Sanscrit MSS. (above 2300) in London; in Madras no one cares for them."



JOURNAL OF THE ASIATIC SOCIETY.

PART I.—HISTORY, LITERATURE, &c.

No. II.—1866.

Description of Ancient Remains of Buddhist Monasteries and Temples, and of other buildings, recently discovered in Benares and its vicinity.—By the Rev. M. A. SHERRING, L. L. B., and CHARLES HORNE, Esq., C. S.

[Received 20th November, 1865.]

In a former paper on the Buddhist Remains found at Bakarya Kund, Benares, which we had the pleasure of communicating to the Asiatic Society last year, it was shown how that at this spot extensive traces still exist of ancient edifices, for the most part of the Gupta period, consisting of remains of several Buddhist temples and of one vihar or monastery. It is our purpose in the present paper, to give the results of farther investigations into the antiquities of this city.

Fully satisfied, as we believe most persons are, that Benares is a city of extreme antiquity, we have endeavoured to ascertain to what portions this epithet will apply. And by the term 'old' we mean not a few hundred years merely, although a city six or seven hundred years old is generally regarded as an ancient city. But we must remember that Benares lays claim to an antiquity of several thousands of years, and undoubtedly it is referred to in various ancient Hindu and Buddhist writings. Consequently, we are not satisfied with discovering in it edifices erected half a dozen centuries ago, any more than we should feel satisfied with discovering edifices of a similar date in Jerusalem, or Damascus, or Rome. The terms 'ancient' and 'old'

as used in this paper, will therefore not be applied to buildings erected 500 or even 800 years ago, but to those of a previous period.

That wonderful mass of lofty houses separated by narrow lanes and packed together in such wild disorder, appearing in fact like one immense structure of gigantic proportions, which extends along the banks of the Ganges for more than two miles, and has a circumference of at least six, although built for the most part of solid stone, and presenting largely the aspect of hoary age, has no right to the epithet of 'ancient.' Some of the buildings of which it is composed, have been standing fully five hundred years, yet there are very few indeed which have not been erected since the commencement of the Mohammedan period in India. But speaking generally, this, together with a part of the northern boundary of Benares, is the oldest portion of the present city, while that large extent of buildings lying south and west beyond it, and occupying four or five times its area, is chiefly of recent date.

The question which we have attempted to investigate, is, what is there in Benares more ancient than, say, the epoch of Mahmūd or Gaznī, who invaded India in the year of our Lord 1001? Are there any remains of the preceding Hindu, Jain, and Buddhist periods? And is there any remnant whatever of the first Hindu period before the rise of Buddhism in the sixth century B. C., or even before it became paramount in the reign of Asoka, B. C. 250?

When, after diligent search and careful scrutiny, we endeavoured to find proofs of the existence of Benares during these earlier periods, we soon ascertained that they were scanty, and with a few exceptions unimposing. The debris of ancient Benares may be traced in the multitude of carved stones, portions of capitals, shafts, bases, friezes, architraves, and so forth—inserted into modern buildings in the northern and north-western quarters of the city. These fragments exhibit a great diversity of style, from the severely simple to the exceedingly ornate, and are in themselves a sufficient proof of the former existence of buildings, of styles of architecture corresponding to themselves, yet differing in many important respects from the styles of modern Hindu and Mohammedan structures, and coinciding with those of ancient temples and monasteries of the Gupta and pre-Gupta periods, the ruins of which are still existing in various parts of India. Were

these the only remains found in Benares, they could not fail to awaken much curious interest in the mind of the antiquarian; and he would naturally carry on a process of induction in regard to them, and would say to himself, 'here are the stones, but where are the buildings? What was their form? What their age?' And with the help of the ruins of other places, he would be able to answer most of these questions satisfactorily, and would, to a large extent, describe the buildings, to which the stones at one time belonged, and would determine the epoch of their erection. Our belief is, that the most ancient ruin yet discovered in India, exhibits nothing older than some of these Benares stones, now embedded in modern walls and parapets, and scattered about in divers holes and corners of the city.

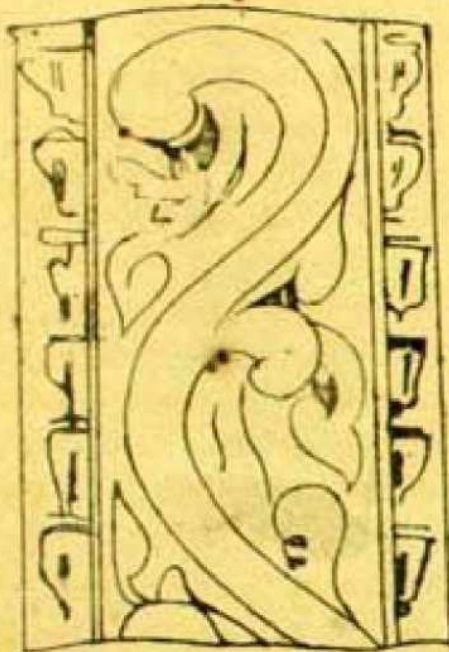
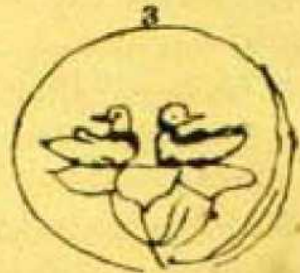
The fact that such old fragments are found in Benares, united with the circumstance that such an exceedingly small number of structural remains of any pretensions to high antiquity are traceable in it, goes far to prove that the city has been not once, but several times, destroyed, until, except in rare instances, and these chiefly consisting of foundations and basement mouldings, not one stone of the ancient city has been left upon another, and the foundations of its temples and its palaces have been torn up, so that their places are no larger known. Moreover, there is no manner of doubt, that the site of Benares has considerably shifted, and that at one time it came quite up to the banks of the river Burna, which flows into the Ganges on its northern boundary, and from which it is now distant nearly half a mile, and stretched beyond the opposite bank, until perhaps it coalesced with the ancient city which, if we may believe the Ceylon historians, encompassed Sarnath in the age when Sakya Muni arrived there to "turn the wheel of the Law," or previous to it. If this be true, the Hindu pilgrim who performs his wearisome journey of perhaps many hundreds of miles, with the object of reaching holy Kashi, and dying in the city of his fathers, is labouring under a prodigious delusion, for the city which he visits, has been chiefly erected under Mohammedan rule, and on a spot for the most part different from that which his fathers trod; and the fanes in which he worships, are not the spacious temples which his ancestors built, but either the pinched and contracted cage-like structures, which Mohammedan emperors just permitted their idol-loving subjects to erect, or modern imitations of the same.

We shall now proceed to describe such ruins and remains of ancient edifices, whether Hindu or Buddhist, which we have discovered in Benares or in its immediate suburbs.

Buddhist Vihār—No. I.

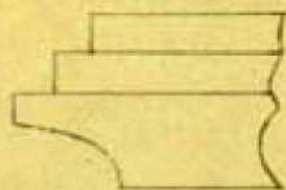
The remains of this vihar are in the interior of the fort at Raj Ghaut, in the outskirts of the city on its northern boundary. There is a small tongue of high land, about fifty feet above the plain below, extending to the junction of the Ganges and the Burna, which, in the mutiny, was strongly fortified, and has been styled ever since, the Raj Ghaut Fort. There is a tradition amongst the natives, that this spot was selected, ages ago, for a similar object by the famous Rajah Banár. It is probable that formerly the whole of this elevated tract was inhabited, and that the Rajah governing the city had his chief residence there. It is the natural key not only of modern Benares, but also of the country for several miles around; and a well-equipped force in possession of it would, with difficulty, be approached and dispossessed. The Government has lately abandoned this grand strategical position on the ground of its alleged unhealthiness.

A short distance to the right of the main road leading into the Fort, may be seen the remains of the vihar, which I will now describe, and which, next to the Buddhist temple at Bakarya Kund, are the most complete, and certainly are the most beautiful, of any ancient remains yet discovered in Benares. They consist of two cloisters in a continuous line, each being sustained by a quadruple colonnade, but differing both in height and in length. The smaller cloister is 66 feet long, and the larger 84 feet, and therefore the entire façade is exactly 150 in length, whilst the breadth of both is uniform, and is 25 feet. There are 8 columns in each row in the one room, or 32 in all; and in the other, there are 10 in each row, or 40 in all; so that the number of stone pillars standing in the entire building is 72. Those in the smaller cloister are barely 9 feet high, and are all square and of a uniform pattern, a slight difference only being traceable in the capitals, which are of the old cruciform shape. There is not much ornamentation on these pillars, but the chess-board and serrated patterns are abundantly carved upon the architraves. The pillars in the larger cloister, including the capital and base, are 10 feet in

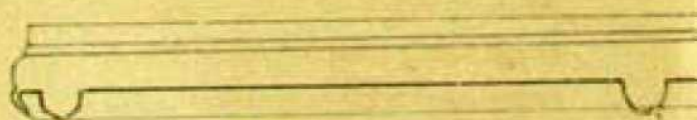


Ordinary type/
Scroll on pillars
from
Bakaria Kuna.

1. 2. 3. 4.
Centres of Scrolls
on pillars
Raj-ghat.



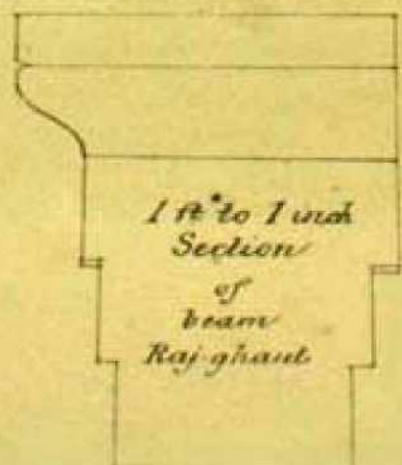
Raj-ghat
a Basement moulding



Lower cloister basement
Moulding Raj-ghat



Section
of
Ordinary beam



1 ft. to 1 inch
Section
of
beam
Raj-ghat



Portion of
pillar, not to Scale

3 Scrolls on the shaft

not to Scale

height, but the architraves above the capitals are of the same height as those in the smaller cloister, namely one foot. These pillars differ greatly both in shape and ornamentation from those just described. Some of them are covered with profuse carving cut deeply into the stone, which in many instances is so sharp and well-defined as to give the appearance of having been recently executed. The lotus plant—pod, leaf, blossom and stem—forms a conspicuous object in many of the designs, all of which are striking, but some are exquisitely chaste and elegant. The *chakwa* or Brahmani duck is represented in various attitudes on the noble scroll-work extending along the square sides of several shafts from the base to the capital. These scroll bas-reliefs equal the carvings on the Sanchi pillars in richness, whilst the designs are much more free in their conception. There were formerly human figures, probably of a grotesque form, carved upon some of the pillars, as traces of them are still distinctly discernible, but these were defaced and almost obliterated by the Mohammedans, on taking possession of the edifice and appropriating it to their own uses. The pillars are regularly arranged with regard to the Singhasan, and the finest pillars are in the centre of the cloister, in the direction of its depth; and above them, near the inner wall, the stone ceiling in two divisions of the roof is singularly carved, and, strange to say, is of the kind described by Fergusson as Jain architecture. One of them is Alhambric in character, while the other is covered with lotus blossoms carved in relief.

There is not the smallest doubt that these cloisters have been much altered from their original condition, and that principally by the Mahommedans who transformed them into a mosque, in which service they were employed even as late as the mutiny in 1857, and were regarded with peculiar sanctity by this people. On closely examining the columns, architraves and ceilings, it is plain that not only has there been a good deal of shifting of places, but new pillars carved in recent times have been added to the old, and some of the old have been cut up for repairs, and their separated portions have been scattered amongst several pillars and joined on to them. The inner massive stone wall running along the entire length of the building, is evidently unconnected with the original structure, as also is the present stone floor which is a foot and upwards higher than the old.

A trench having been dug on the east side, it was discovered that the bases of many of the columns were embedded deep below the modern stone pavement, while in the front of the smaller cloister, at a depth of about a foot, the outer moulding of the ancient floor could be traced continuously from one end to the other. Notwithstanding all these extensive alterations which the building has undergone from time to time at the hands of different masters, we cannot but think that many of the columns are standing on their proper sites, and that the edifice, although greatly changed, is still in its main features a Buddhist structure. The cloisters were transformed into their present condition as a mosque some 80 years ago, and the modern pavement was then put down.

There is reason to believe that a third cloister, corresponding to the smaller, formerly existed at the southern extremity of the larger cloister; and this supposition is greatly strengthened by the circumstance of a *Singhāsan* or throne of Buddha, already referred to, being still standing by the wall in the centre of the latter, but altered from its original form, having been used by Mohammedan Mullahs as a rostrum or pulpit. The vihar, when complete, was in all likelihood a square, each side being at least the length of these three cloisters, and the chief Buddha was exactly opposite the centre of the square. What other buildings were formerly here, in addition to those now visible, can of course only be conjectured. It is probable that on three sides were cloisters, and on the fourth, namely that to the east, was a row of temples, the largest containing the principal figure of Buddha. That other buildings were once here, is certain from the various sculptured stones found near by. We observed seven pillars, sixteen isolated capitals, and four large carved stones used for architraves, some of which support a recently erected structure attached to the smaller cloister.

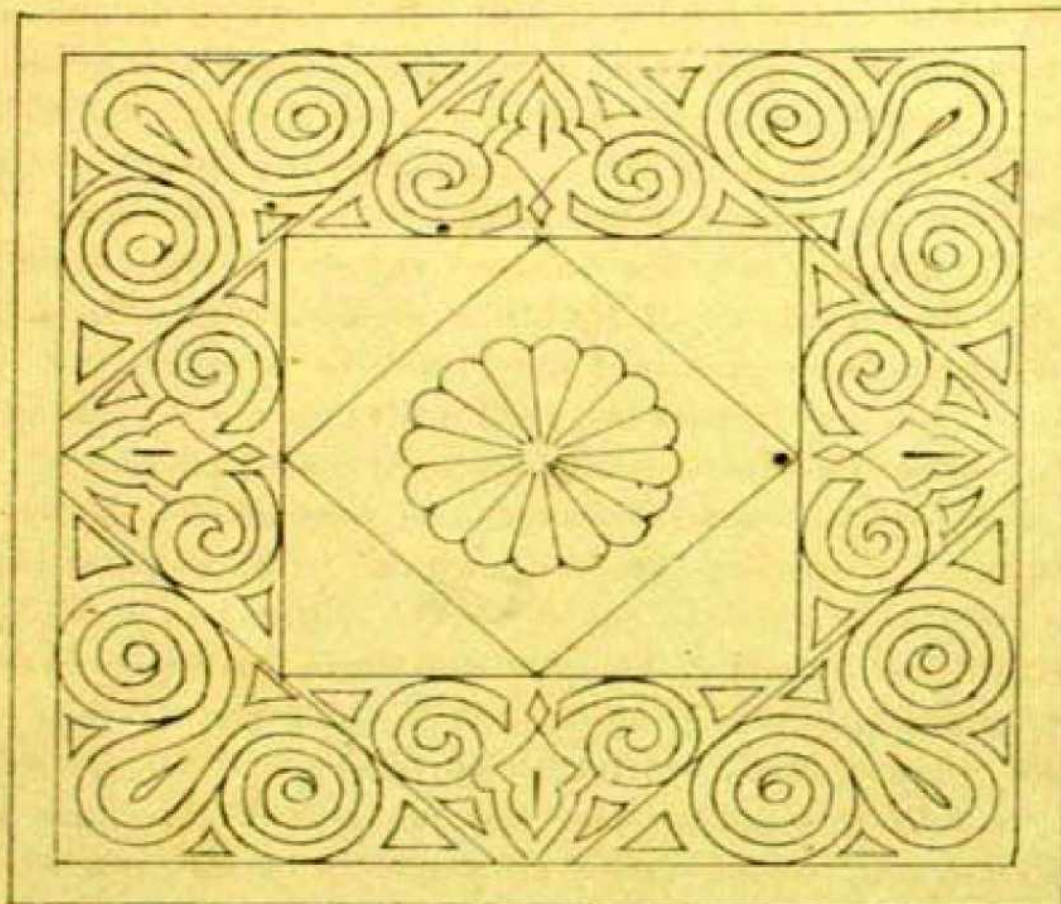
The venerable ruins described above, present a very remarkable appearance. In the year of the mutiny, barracks for European troops having been erected in their neighbourhood, they were converted into a vast cook-room or kitchen. Fires were lit inside on the stone floor from one extremity to the other, and consequently the roof, walls, and columns, were charred by the heat and blackened by the soot, so that now the interior of this grand edifice is most dismal and

BUDDHIST CHAITYA

N.W. OF RAJ-GHAUT FORT.

OLD CHAITYA CEILING.

Scale 2 feet to 1 inch.



PILLAR.
2 feet to 1 inch.



forbidding. Mr. Horne spent a few rupees in cleaning the building, and in removing, as an experiment, the encrusted soot from some of the carvings. Fortunately the Mohammedans or the British Government authorities, we know not which, in their care for these beautiful works of art, have embedded them in mortar from base to capital, so that many of them might be restored. The removal of the encrustations, however, will have to be accomplished with the greatest care, or else the surface stone, rendered friable by the heat to which it has been subjected, will come away with the superimposed mortar, thereby destroying the delicate edge of the carvings. We trust the Government will not grudge a few hundred rupees for the thorough cleaning of this fine specimen of Buddhist architecture. The inner stone wall and the modern pavement should also be removed.

Besides these remains, there were, until quite recently, hundreds of stones lying about in the fort, bearing traces of great antiquity. In the mutiny, many of these were collected, and were made use of for the foundations of temporary barracks which were then erected. These stones may have once belonged to the vihar just described, when it existed in its integrity, but may also have been portions of other contemporaneous buildings situated in its vicinity.

During the mutiny, Mr. Tresham, by Government order, blew up some ancient buildings standing near the vihar, and there are yet the foundations of one, which defied all attempts at its destruction. Mr. Horne also remembers a chaitya which was removed to afford space for barracks.

Buddhist Chaitya No. I.

A few hundred yards due north from the old gateway leading into the Raj Ghaut Fort is a mound of circumscribed extent, now used as a Mohammedan burial-ground, on the summit of which are the remains of an old Buddhist chaitya or temple. They consist simply of four pillars, richly carved with scroll-work, sustaining an ancient roof. At the corners of the shafts is the ordinary ornamentation resembling a chain of lotus seed-pods. The capitals are cruciform, and the bases are square with embellished faces. The ceiling is very beautifully sculptured, and is composed of slabs over-lapping one another, with the centre stone crowning the whole, according to the

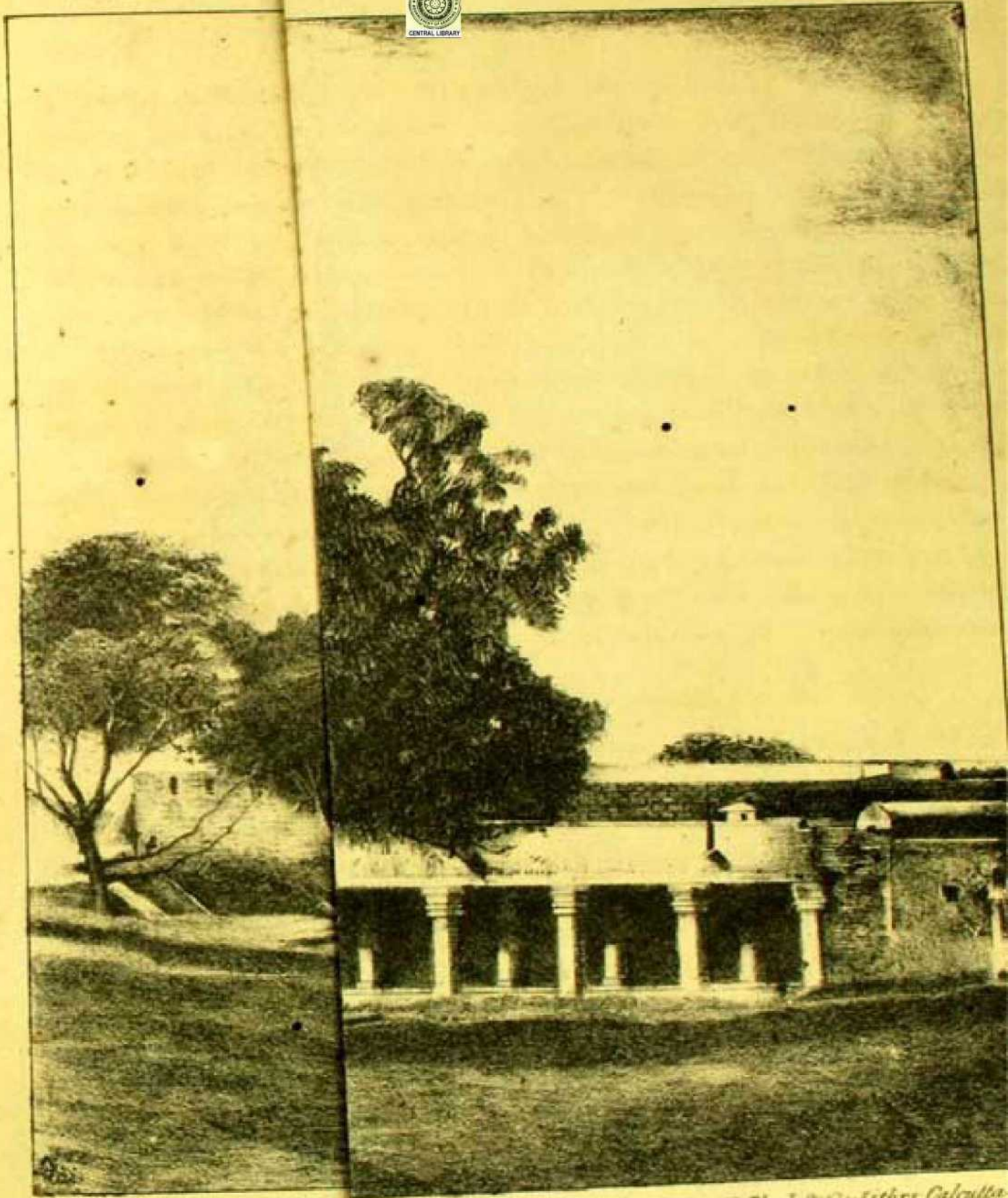
primitive mode of Indian roof-building. This latter stone exhibits the out-spread petals of a lotus blossom, while eight out of the twelve triangular spaces formed by the intersection of the slabs, are freely carved with the scroll-pattern. A few sculptured stones lie about the mound; amongst them is an erect figure of Buddha with garland and armlet, much mutilated. There are also three stone beams or architraves bearing the chess-board and spear-head patterns. In the small terrace likewise on which the chaitya stands, are inserted four carved stones, taken doubtless from some ancient building formerly in the neighbourhood. The occurrence of three or four plain cloister pillars of the usual form, adapted by the Mussulmans as head-stones for graves, together with the carved architraves already alluded to, would seem to indicate that a small cloister for monastic purposes must originally have stood upon this mound, which was then terraced, the stones of which have been by degrees removed both for building Mohammedan graves, and also for repairs in the Fort.

Small Mosque in the Budaon Mahalla.

In the Budaon Mahalla near the Raj Ghaut Fort, a short distance south of the high road, there is a small mosque in an enclosure, made up to a great extent of ancient remains. The building seems to have been curtailed from its original dimensions, leaving a ruined portion still standing on its southern side. The entire structure contains seventeen stone pillars, eight of which exhibit ornamental carvings and probably belonged to a Buddhist chaitya. There are also eight capitals inserted in the walls without shafts and bases, and in addition there are fragments of other capitals in various places. None of these old remains are in situ. They were brought, most probably, from some temple in the neighbourhood, perhaps indeed from the mound occupied by the ruins of the Buddhist Chaitya No. I., which is not far off.

Ancient Mound or Ridge running from the Burna, near its confluence, into the Adampura Mahalla.

This very remarkable ridge extends for a long distance, and commences at the river Burna when at its flood. In the dry season therefore there is a stretch of low land lying between its extremity



Photographed by W. Grant Esq

T. Black & Co Lithrs Calcutta

in that direction and the bed of the stream itself. The ridge is manifestly an artificial work, and was originally intended either as a wall to the ancient city, or as a rampart thrown up against it and the neighbouring fort of Raj Ghaut. The latter supposition was that held by Mr. James Prinsep, who imagined that it was cast up by the Mohammedans in their attack upon Benares, and was specially directed against the fort. This supposition may be true, although it is difficult to perceive how it could have been of much service either in an attack on the fort or on the city, especially in a period when artillery was not in use. Had it reached as far as the river Ganges, we could understand how, by severing the fort from the city, it might have been a source of damage to both, but the south-western extremity is not near the Ganges by a third of a mile or perhaps more. We are inclined to think, however, that this extremity was once connected with that river, but at a time far more ancient than the Mohammedan conquest of India. On the whole, it appears not unlikely that this long embankment was the old boundary of the city in the early periods of its history, which was possibly employed for offensive purposes by the Mohammedans on the extension of the city to the south and south-west, and the consequent abandonment of this means of defence by the inhabitants. The embankment may have been originally carried on to the Ganges in a straight line with its present direction; or, making a short circuit, may have entered it by Tilia Nálá, on the banks of which are the remains of a Buddhist temple, which will be hereafter described. In this case, a portion of it must have been thrown down and swept away to make room for the growth of the city, and there is good ground for supposing that the city extended in a narrow band on the banks of the Ganges, about as far as the Man-mandil observatory, even before the Christian era. Should this idea be correct, it would follow that the most ancient site of the city of Benares was situated within the limits of this wall, stretching across from the Burna to the Ganges, cutting off a tongue of land as far as the confluence of the two rivers, and including the high land of the Raj Ghaut Fort, which was, in all probability, once well populated. The city must have been then of small extent, as compared with its existing dimensions, unless, as we

believe, and as it is almost indisputably certain, it crossed over to the right bank of the Burna.

That both sides of the river Burna were in former days better inhabited than at present, is somewhat corroborated by an examination of the ground on both sides. Brick debris is scattered about among the fields on the right bank of this stream, and old coins and broken stone images are occasionally found by the people, or are dug up by the plough; while on the other, or Benares side, not only are old remains found in the fort, but also below it on the lowland already referred to, blocks of stone, some of which are carved and exhibit ancient mason marks engraved upon them, are still to be seen. Moreover, it is stated in the Ceylon Annals that formerly the city surrounding Sarnath, (about three miles from the right bank of the Burna,) coalesced with or was a part of Benares, which, if true, must have been at a period of remote antiquity. Indeed, the allusion in these records is to an epoch long anterior to that of the historical Buddha or Sakya Muni, and therefore prior to the sixth century before Christ. This account must of course be received with much caution, and not as absolutely authentic history. At the same time, it is manifest that there was a tradition amongst the Buddhists of India, conveyed thence by their missionaries to Ceylon, that in remote ages the city of Benares extended to Sarnath.

In visiting this ridge or embankment, it will be observed that the high road leading to Raj Ghaut cuts right through it, the earth of the cutting being used to raise the road above the level of the country. It is well to remark too that where the road passes under the fort to the ghaut, the soil has been cut away to make room for it, so that formerly we may suppose that instead of a steep and almost precipitous wall which the elevated land to the east of the road now exhibits, the mound of the fort in this direction diminished in a gradual slope, terminating perhaps not far from Tilia Nálá.

The ridge is in one part formed of three terraces, the uppermost being perhaps thirty feet above the land, upon which elevated spot is the tomb of Míra Sahib. In the mutiny a large portion of the mound opposite the Fort was cut away for strategical reasons, although what is left is sufficient to prove of great service to an enemy attacking the fort.

On the south side of the ridge, in sight of Míra Sáhib's tomb, is an Imambará, a modern edifice, built altogether of new materials; and a few paces distant from it are two small structures, one in front of the other, which, although of recent erection, are partly composed of old materials. Each building possesses four ancient pillars of the Buddhist type, and lying about in various places are four pillars more, five *kulsees*, two architraves, and seven bases, one of the latter being richly carved. All these are the spoils of some ancient temple or monastery.

*Remains of Buddhist Chaitya, No. II., and Buddhist Monastery,
No. II., at Tilia Nálá and Maqđum Sahib.*

We have chosen to unite these remains, and to speak of them under one head, because, although separated and standing in different Mahallas, yet they are near enough together to give rise to the supposition, that they may have been at one time connected. There is no question in our minds that at least one monastery stood in this neighbourhood, which is very rich in old carved fragments of stone scattered about amongst the walls and foundations of dwelling-houses and in divers other places. Perhaps it may be questioned whether the ruins at Tilia Nálá, now forming part of a deserted mosque, were originally a portion of a monastery or a portion of a temple, but our own opinion is in favour of the latter; yet even though this conjecture were true, it would still be probable that the temple was within the precincts of a large monastery and was considered to be a portion of it.

The remains at Tilia Nálá are immediately above the Nálá on the high ground of its left bank, a very short distance only from the point where it runs into the Ganges, and close to the main street under which the stream flows. The ruins not only overhang the brook, but there is no doubt that at one time they must have extended nearly, if not entirely, across its present bed. They consist of seventeen massive square columns in three rows, namely four double columns in the front row, four single ones in the second, and five in the third or innermost row. Between the third and fourth pillars of the last row is the Singhasan of Buddha, an immense slab of stone, nine feet three inches in length and five and a half in breadth, retreating beyond the boundary wall behind, into which all the pillars of

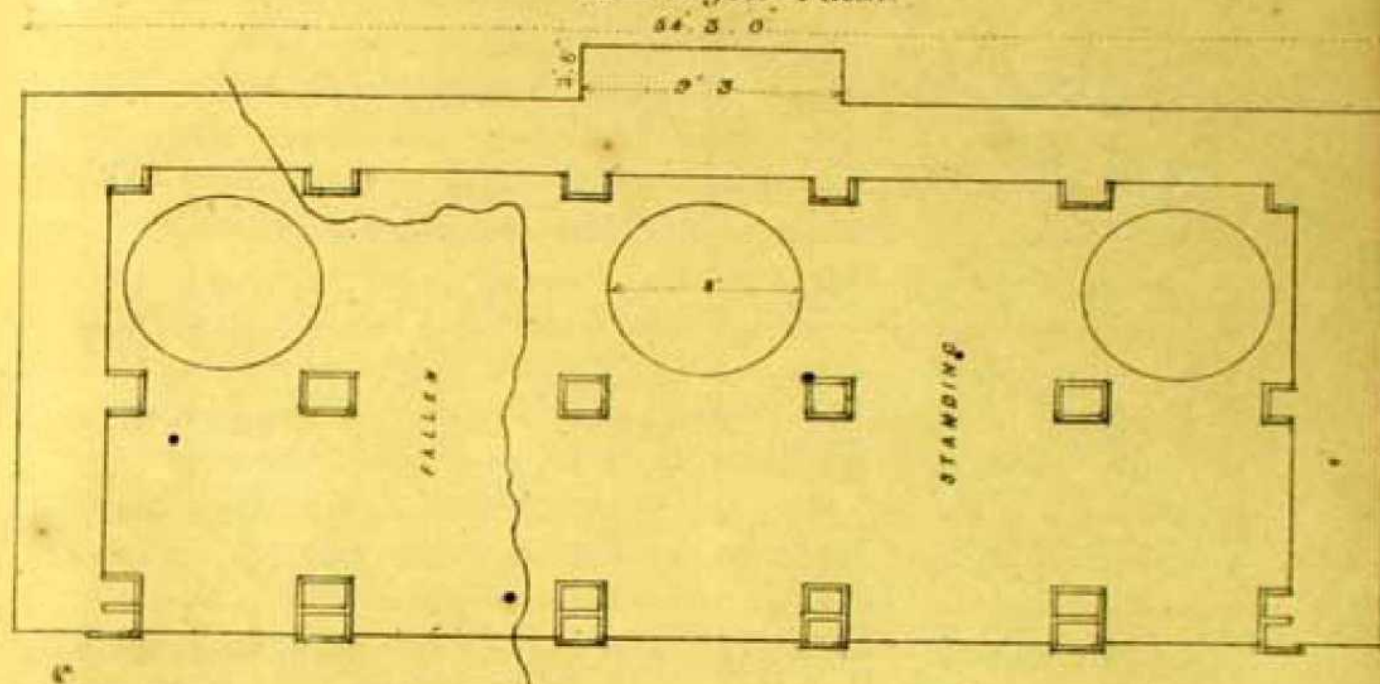
this row are inserted. There can be no dispute that the Singhasan was in the centre of the building, that is to say, that as there are three pillars to the right of it, there were as many to the left, in each of the three rows, the front row being of double pillars throughout. Re-constructing the edifice as it originally stood, therefore, there were one row of six double pillars, and two rows of six single pillars, or twenty-four pillars in all. Each capital is ornamented with the bell pendant, of which the Buddhists were so passionately fond, and which was after them much used by the Brahmins. The double columns are surmounted by one huge capital, five feet and a half in breadth, each of which possesses a long arm for the eaves stone. Over the two inner rows are two domes, one of which is above the Singhasan, and is more ornamented than the other. There must have been originally a third dome to the left of the central dome, corresponding to that on the right. Outside the building there is a fine basement moulding which doubtless belonged to the primitive structure. Estimating the building as it once stood, it was fully fifty-four feet in length and about twenty-four in breadth. The Mussulmans may have altered it considerably in transforming it into a mosque, but we apprehend that not a little of the old temple still remains. Some of the large stones have fallen into the Nálá or upon its banks, and others have not unlikely been made use of in the repairs of the bridge, and of its adjoining stone wall, so that we believe it would not be a difficult task to find nearly all the missing pillars and capitals.

The Maqdam Sahib is a square enclosure in the Gulzar Mahalla near to Tilia Nálá, used by the Mohammedans as a cemetery. On its northern and western sides are cloistered pillars, partially in situ, with portions of ancient stone eaves overhanging their capitals, presenting on their upper surface imitations of wood-carving. There are twenty-five pillars on the western side, and twenty-eight, or, if all could be seen, probably thirty-two, on the northern side. Several of the pillars are carved; while some of the capitals are ornamented, and some are double. There may be seen also handsomely carved stone brackets for the support of the eaves above alluded to. The eastern wall bounding the enclosure is evidently composed, to some extent, of cut stones of an ancient date. The entire court is one hundred feet long from east to west, and sixty feet broad from north to south.



ROUGH PLAN
OF
TILIA NALA VIHAR CHAITYA

Scale 12 feet = 1 inch.

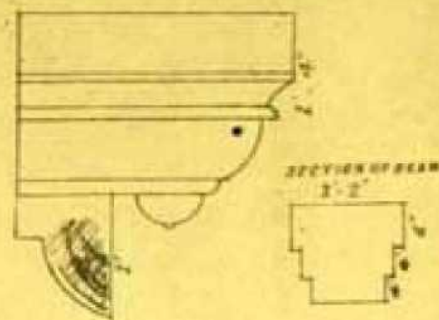


Enclosing-wall 3 ft thick- with 9 inches of each pillar built into it.
Outside measurements. 54'-3"-0. by 24'. Between shafts of columns 8 ft
Double columns- capitals with long arm for eaves done 5'-6" in one piece, size of all shafts 15 inches square.

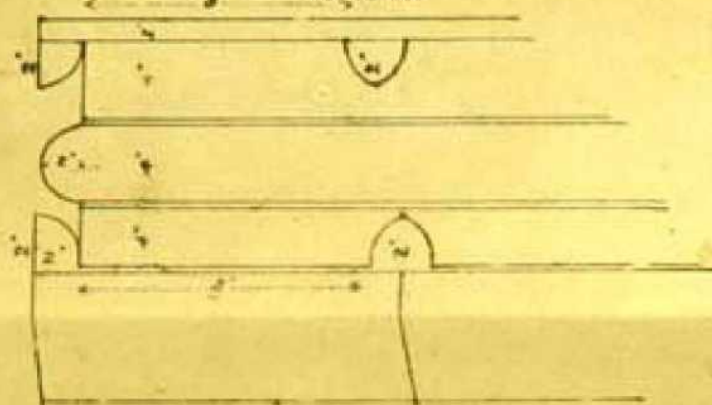
SCROLL ON CAPITAL



PORTION OF CAPITAL
LONG ARM OF DOUBLE CAPITAL.



SECTION OF BASEMENT MOULDING.
TO SCALE.



SITE OF BUDDHIST VIHAR—No. III.

Lát Bhairo.

At the junction of the old Ghazee-pore road with the Raj Ghant road, to the north of the latter, and about a short mile from the fort, is a large square tank, on the left bank of which, as on a terrace, stands the *lát* or pillar, which gives the name to the spot. It is probably not more than three or four feet high inside, and is covered with copper sheeting. We endeavoured to prevail on the faqir residing here to permit us to lift up the copper cap, by removing the plaister which connects it with the flooring below, in order to gain a view of the stone pillar which it now conceals; but so great is the reputed sanctity of this object, that our united efforts were entirely fruitless, and had we persisted in them, a disturbance might have been occasioned. The original stone column, of which the concealed pillar is doubtless a small fragment, was about forty feet high, and, it is reported, was covered with ancient carvings, which were most probably inscriptions. This was thrown down by the Mahommedans during a terrible conflict with the Hindu population in the early part of the present century, when Mr. Bird was magistrate of the city. The natives say, that the pillar was thrown into the Ganges, but as that stream is half a mile off or more, this must have been done piecemeal. In all likelihood it was destroyed by fire, the action of which on sandstone soon causes it to crumble to pieces. As there is strong reason for believing that this was one of Asoka's pillars, it would be exceedingly interesting to inspect the remaining fragment, which we may fairly suppose to belong to the original column, and in that case to possess a portion of an inscription sufficient to verify its connexion with Asoka, or with the Guptas, or with the monarchs of any other era by whom the column was erected.

It is important in our present investigations to know that the pillar once stood in the midst of a temple, that is, in its courtyard, which temple was destroyed by Aurungzebe, and on its site a mosque was erected, the courtyard of which enclosed the pillar. On examining the terrace where the Lat stands, it is exceedingly manifest that the upper portion has been thrown up in modern times, and that the ancient level of the ground was some six or eight feet lower than

what it now is, and indeed was even with the soil of the Mahomedan cemetery close by, in the midst of which are a few Buddhist remains in the shape of pillars and architraves made up into a Mahomedan sepulchre. What this so-called temple was, admits of very little question, inasmuch as the boundary walls of the terrace and of the neighbouring cemetery and garden exhibit a considerable variety of isolated carved remains, sufficient to afford abundant attestation to the supposition that formerly a large Buddhist structure, most probably a monastery with a temple connected with it, stood on this site, covering the whole extent of the ground elevated above the tank on its northern side. Some of the carvings are in excellent preservation, and are worthy of being removed to the archaeological collection in the Government college grounds in Benares. There are several pillars embedded in the brickwork, and also a stone seven feet in length and one and a half in depth, which is deserving of special remark, as on its face are projected four magnificent bosses, each ten inches in diameter, with a projection of two inches from the surface of the stone. These bosses must have formed part of the decoration over the main entrance to the monastery.

Below the upper terrace on which the Lat stands, is, as already observed, a Mohammedan cemetery with a *Rauza* or tomb in the middle. This building rests upon sixteen pillars, each being eight feet two inches in height, and the architraves between their capitals being one foot two inches in thickness. In addition, there are five pillars in the verandah to the south. Some of the pillars are ornamented with scroll-work and the lotus plant, while their four corners are deeply cut with representations of the lotus seed-pod. One pillar has eight sides in its lowest division and sixteen in its upper, and has also a band of four grinning faces connected together, and under them a row of beaded garlands. The pillar is crowned with a round stone projecting two inches, on the face of which is a curious assemblage of thirty-two grotesque faces all round the edge of the stone, with beaded garlands and tassels depending, issuing from their mouths.

It should be mentioned, that if our conjecture, that the upper terrace has been only recently thrown up, be correct, then on the supposition that the fragmentary pillar on its summit is part of the original pillar which in ancient times stood here, it would follow that the

length of the existing fragment is equal to the depth of the terrace above the foundations of the neighbouring cemetery, in addition to its present elevation above the terrace, and to the extent of insertion of its lower extremity in the primitive but now subjacent soil. In this case, it would be not less than from fourteen to sixteen feet in length.

BUDDHIST CHAITYA—No. III.

Battis Khambha.

About a third of a mile to the east of the Bakaryā Kund Remains, is a beautiful little structure called by the natives Battis Khambha or thirty-two pillars. It is a very picturesque object as seen from the Raj Ghat road, from which it is some four hundred yards distant. It consists of a dome sustained by twenty-four square pillars, standing in pairs at intervals all round. Formerly each corner had four pillars, thus increasing the present number by eight, and then, of course, the entire number was thirty-two; but two from each corner have been removed, leaving the spaces occupied by them empty. All the upper part of the building is Mohammedan, while all the lower part is indisputably Buddhist in its style of architecture. On the western side is an abutment for the Singhasan of Buddha, similar to that which exists in the Chaitya at Bakarya Kund, and indeed, so far as our knowledge extends, in all *bonâ fide* Buddhist temples. The pillars stand upon a platform raised above the ground, and in the interior of the building is a Mohammedan tomb.

It is remarkable that there should be so many ancient remains lying almost in a straight line from Bakarya Kund to the Raj Ghat fort, yet most of the remains hitherto referred to, lie in this line. We have no doubt that formerly a large number of Buddhist buildings existed between these two extremes, and that the foundations of some of them might be discovered, if a keen search were instituted, in addition to the more prominent remains already brought to notice. It seems evident therefore that there was a road here during the Buddhist period, not far removed from the track of the present one. This road was at right angles to another proceeding from Bakarya Kund in the direction of Sarnath, which still exists. Search might be made along this road for the foundations of ancient buildings and

for Buddhist relics, as there can be no doubt that constant communication was kept up by the monks of Sarnath with Bakarya Kund, in both which places there were vast monastic edifices and numerous temples.

Near this Chaitya and between it and Bakarya Kund is a small building standing by the road side, in which are several pillars of the most ancient type inserted into the containing walls. They have been very probably brought from Bakarya Kund. The building has an unpretending appearance, and is kept whitewashed by the Moham-medans, its proprietors. •

BUDDHIST VIHAR—No. IV. •

Arhai Kangura Mosque.

It is not our purpose thoroughly to describe this handsome structure, which is one of the finest mosques in the whole city, and is situated in the Mahalla bearing its own name. Its magnificent and lofty dome, as well as various parts of the mosque itself, unquestionably exhibit a Mohammedan style of architecture, but we have no hesitation in saying that by far the greater portion of the building, and certainly five-sixths of its materials, belong to an epoch far more distant than the Mahommedan invasion. The numerous square columns with their cruciform capitals, and also the screens between some of them in the upper story, are of Buddhist workmanship; but we are inclined to think that both Buddhists and Hindus have made use of the same materials in different eras, and that in fact the mosque is a mixture of three styles, namely Buddhist, Hindu, and Moham-medan. The first edifice was, we believe, a monastery, with (most probably) one or more temples attached; but it is hard to say whether any portion of the original building exists in situ, and we have not sufficiently examined it to be able to pronounce a decided opinion on the point. Our conviction, however, is that certain leading characteristics of the first structure were perpetuated by the Hindus in that which they raised on the departure, or rather expulsion, of the Buddhists from Benares. It is not easy to determine accurately what this Hindu building was, but perhaps it is more likely to have been a math or a sort of monastery or religious house for Hindu ascetics, such as exist in the land at the present day, than a temple. In the

roof of the second story of the mosque a slab was discovered bearing a long Sanscrit inscription, towards the end of which is the date 1248, which, regarded as Sambat, is equivalent to A. D. 1190. The inscription itself is of no particular importance, except that it abounds with references to the Hindu religion, showing that it belonged to a building erected by a Hindu, and therefore subsequent to the Buddhist period. It alludes also to certain tanks, temples, and maths, erected and embellished in and about Benares, which of course were all in honour of Hinduism. It is not unlikely indeed that these structures were erected and this inscription was written with somewhat of a religio-political object, to testify to the triumph which Hinduism had then recently gained over Buddhism; for there is good ground for believing that the buildings at Sarnath were not burnt, and the monks were not expelled therefrom, till about the twelfth century of our era. We have obtained a copy of the inscription in Sanscrit, with a translation into Hindi, through the kindness of Babu Shio Parshad, Joint Inspector of Schools, whose intelligence, enterprise, and extensive knowledge place him in the front rank of native gentlemen in these provinces.

We would direct especial attention to the small side door or postern with its massive wall, to the right of the building, which has a great appearance of originality, and also to two noble capitals of gigantic dimensions, lying in the court-yard in front of the mosque and turned into small cisterns. They are the largest carved capitals we have found anywhere.

HINDU TEMPLE OF KIRT BISHESHWAR.

Alamgiri Mosque.

Near the temple of Briddhkál, one of the very few Hindu temples of the earlier Mohammedan period still standing in Benares not appropriated by the Mussalmans, and a few paces from the well-known shrine of Rattaneshwar, is a mosque spoken of in the neighbourhood as the Alamgiri Masjid, which was erected during the reign of Aurungzebe or Alamgir, and was designated after that emperor. Upon it may be read the following inscription in Arabic:—

قول وجهك شطر المسجد الحرام
سنة ١٠٧٧ هجري

The translation of which is, "Turn your face towards the sacred mosque. 1077 Higira," or A. D. 1659.

The mosque is built, tradition states, from the materials of the Hindu temple of Kirt Bisheshwar, and has three rows of lofty stone pillars, eight in each row; but the pillars at both extremities are not single, but three-fold. The capitals are large and massive, and are cruciform in shape. In the centre of each shaft, upon all the four sides, is the boss ornamentation, each boss being fully a foot in diameter. The pillars have a double base, a false and a true, the one consisting of the lower end of the shaft, the other, the true base, of a separate stone. Both are covered with carvings. Some of the architraves also bear upon them the boss pattern; but it is possible that these were formerly shafts of pillars. The inner wall of the mosque is likewise of stone. Viewed from behind, many of the blocks display various mason marks inscribed upon them.

From an examination of the marks or symbols, and of the architecture represented by the remains now briefly described, there is no reason for supposing that the temple which once stood here, and which was levelled to the ground by Aurungzebe, was of great antiquity. The style of architecture has a Buddhist basis, yet is not purely Buddhist, and the symbols are not necessarily Buddhist at all. We should be inclined to fix the date of the Hindu temple at some five or six centuries ago. It must have been a place of great sanctity, as many Hindus still visit the spot on pilgrimage, and instead of an image (which we suppose the Mohammedans would not allow them to put up) worship the spout of a fountain rising up in the centre of a small tank in the court-yard of the mosque. It is not improbable that the tank is the site of the old temple; but if the temple was a large one, as is likely, it must have occupied not only a considerable portion of the present courtyard but also some ground in addition on either side. A few persons perform their devotions in the tank daily, but the grand festival is at the *Shio rát mela*, for one day in March, when crowds throng reverently around the sacred spout, and present it (or perhaps regarding it as a god, they would say *him*, or *her*,) with abundant offerings, all of which, down to the last rupee, are received by the Mullah of the mosque, who thinks, we suppose, that if he winks at the idolatry, which in fact he cannot put down, he may as well be paid handsomely for it.

Attached to the mosque is a corridor, built a few years later, on the inner wall of which is the following inscription:—

ز حکم شاه سلطان شریعت • شهاب آسمان سرفرازی
 دلیل زهد برهان طریقت • محمد شاه عالمگیر غازی
 سر اصرام بت خانه شکسته • ظهور مسجد دلخواه گشته
 باستصواب نورالله مفتی • بقاء خانقاه هست پیدا
 غلام درگه پیران چشتی • زدو لتخانه تاریخش هویدا
 سنه ۱۰۹۶ هجری

In noticing the remains of the Kirt Bisheshwâr temple, we are aware that they do not come under the designation of "old" or "ancient," as applied to other remains described in this paper, and yet, as they are not without interest, we have given them a place in it.

BUDDHIST CHAITYA—No. IV.

Chaukhambha Mosque.

The long Chaukhambha street in the city of Benares, in or about which most of the great bankers have their houses of business, takes its name from four low massive pillars of modern erection, standing in the lowermost story of a lofty building, the weight of which they entirely sustain, situated towards its north-eastern extremity. There is a narrow court running out of this street, which terminates in a small enclosure, on the further side of which is a mosque. The entire enclosure has a very remarkable appearance, and, for the archæologist, is a place of considerable interest. The entrance is by a doorway let into a huge breastwork or wall formed of blocks of stone, which is twenty feet long, thirteen feet high, and four feet thick, and is constructed for the most part systematically, as is evident from the ornamentation on one stone answering to that on the stone contiguous to it. Over the doorway is an inscription in Arabic. But with the exception of this doorway and the castellated appearance crowning the wall, there is nothing Mohammedan in its architecture.

The mosque and corridor adjoining it are supported by twenty-four pillars, of which six are double. The capitals are of the simple cruciform pattern, and their outer limbs are decorated with the dwarf bell ornamentation. To the south of this building is a staircase

leading up to the roof, built of heavy stones; and along the south side of the enclosure, for the space of about twenty-five feet, is a low stone wall six feet in height, and, attached to it, a peculiar ledge three feet from the ground. It is known that a similar wall exists on the north side also, but hidden from view.

In our judgment most of the pillars are in situ, and originally formed part of a Buddhist structure, but whether of a temple or of a monastery, it is difficult to say. Our opinions are divided on the subject, and the former has been assigned to the building by way of a heading to this chapter. The wall with the projecting bench is very curious. The latter may have been used by the priests or monks for reclining upon.

BUDDHIST VIHÁR—No. V.

Aurungzebe's Mosque near Bisheshwar Temple.

The mosque built by the emperor Aurungzebe on the foundations of what is commonly regarded, though erroneously, as the old or original Bisheshwar temple, is of interest not for its own sake—for notwithstanding its lofty appearance, it is a structure without any striking beauty in its own right—but for the sake of the ancient buildings with which it is associated, and with the materials of which it has been largely constructed. The courtyard consists of a terrace raised some five feet above the level of the temple quadrangle, in the centre of which it is situated, and occupying a large portion of the area. On walking round the quadrangle and examining the retaining wall of the terrace, one's attention is arrested by peculiar openings or niches in the wall, in which architraves, and capitals, and parts of pillars on which they rest, are visible, but in some places the openings are filled with earth almost up to the level of the capitals. Proceeding from west to east, the ground gradually declines, until, after descending four steps and arriving opposite a large stone bull or Nándi, the opening in the terrace becomes clear, and a cloister, such as surrounds a Buddhist vihá, comes into view, and reveals the character of the entire series. It consists of a small chamber sustained by genuine Buddhist pillars, severely simple in their type, and without doubt of great antiquity. Formerly a succession of such cloisters encompassed not less than three sides of the existing terrace, which

must consequently date from the same epoch. It would be desirable, if the consent of the Mohammedans could be obtained, to remove the external wall by which these cloisters have become almost completely hidden, in order to ascertain what is their extent and condition.

This series of cloisters formed the lowermost story of a large Buddhist monastery, which once enclosed the entire space occupied by the terrace, and rose to the height of probably two or three stories above it. On the southern side stood the chief chaitya or temple, which, on the suppression of Buddhism, passed into the hands of the advocates of another religion, who transformed it according to their own tastes. The mosque on this side is altogether composed of the remains of an ancient temple of large dimensions, and of very elaborate workmanship. The high pillars, moreover, on its northern face have been abstracted from the same spacious building. These remains are partly Hindu, and it is unquestionable that the edifice which was destroyed in order to make way for the mosque, was an old temple of Bisheshwar. An excellent ground plan of this temple, prepared from a minute examination of the existing remains, was drawn by Mr. James Prinsep, and published by him in his "Views of Benares." These remains, however, are only partially Hindu. Some portions, judging from the elaborate ornamentation of certain details which it was the custom of the Buddhist architects to leave plain, seem to be of Jain origin, and to have been appropriated by the builders of the Hindu temple. If this supposition be correct, the mosque with its terrace exhibits a singular architectural anomaly, and presents us with no less than four styles, namely Buddhist, Jain, Hindu and Mohammedan. Indeed it would not be wrong to add a fifth style, for the square terrace pillars with their cruciform capitals are so simple in structure, that, compared with the highly carved and decorated pillars of mediæval and later Buddhist history, they belong to another style, which may be called early Buddhist or Hindu, according to which of these two ancient religious communities is supposed to have invented it. It is not our object to discuss the interesting and also important topic, who were the first Indian sculptors and builders of permanent works, yet it is one which must one day, when materials have been sufficiently accumulated, which they have not been at present, be thoroughly investigated.



When this is settled, the antiquity and origin of these terrace pillars will be settled likewise.

BUDDHIST VIHÁR —No. VI.

Ad-Bisheshwar Temple and neighbouring Mosque.

Ad-Bisheshwar is the name of a lofty temple situated a short distance from Aurungzebe's mosque just referred to, and in sight of it, and is held to be, by some persons, the original or most ancient temple of this deity. The derivation of its name only bears out this supposition, for the temple itself, from the pinnacle to the base, has nothing really ancient about it. On the eastern side of the enclosure the ground takes a sudden rise of eighteen feet, forming a terrace manifestly of artificial construction. On this side there is a retaining wall of stone masonry, which is wanting on the southern side of the terrace, where there is only an earthen bank. The other two sides of the terrace are covered with buildings, which prevent the exact ascertainment of its boundary in these directions. On that flank which is contiguous to the Ad-Bisheshwar enclosures, stands a mosque erected some eighty years ago or less, but not finished then, for want of money. It was built of stones found on the spot, with new Chunar slabs added. The terrace existed before with the buttress, and is evidently of ancient construction.

The building is in two divisions, each of which is $23\frac{1}{2}$ feet in length, connected together by a massive wall $5\frac{1}{2}$ feet thick, composed of large blocks of stone. This wall projects considerably beyond the building into the courtyard to the east, and has the appearance of a huge buttress; but what its object is, seeing that the mosque, which is entirely of stone, is amply sustained by its columns and walls, and requires no such additional support, it is hard to say. Possibly the buttress is pierced with a staircase, leading formerly to an upper story which the buttress supported, and the Mohammedan architects, not caring to remove the massive prop, have retained it in the mosque. They appear, moreover, to have confined themselves chiefly to materials lying upon the spot, as in three places carved pillars, similar to those sustaining the centre aisle, have been adopted as architraves. There are fourteen columns in the interior of the mosque, which are peculiarly but not extensively carved, and are crowned with orna-

mented capitals. The western wall is strengthened externally by three rounded buttresses, which are of the Pathan dynasty, like those found at Jaunpore, and were built at the same time. They did not exist in the Buddhist period, and were added as much for ornament as strength. All the mosques about old Delhi have them.

There is no doubt in our minds that the Ad-Bisheshwar temple stood on this site, and was destroyed by the Mohammedans, who, as usual, transferred its stones to their own mosque. The neighbouring temple bearing this name, the Hindus built, with the kind permission of their friends, the Mohammedans, of course, for the purpose of perpetuating the worship and the honour of their old idol, Ad-Bisheshwar. Yet, while allowing that the edifice standing on the site of the present mosque when the Mohammedans took possession of it, was the temple of Ad-Bisheshwar, we are nevertheless equally certain that the primitive building was of a Buddhist character. We were inclined at one time to imagine that, from its proximity to the Buddhist Vihár No. V., it must have been a part of that monastery, but two reasons have led us to abandon that idea. One is, that a separate terrace of extensive dimensions was appropriated to this structure, whatever it was, and that between this terrace and that of No. V., the ground is depressed corresponding to the depression of all the neighbouring soil; and the second is, that the style of architecture of the ancient buildings upon or around the two terraces, differs exceedingly. We are led to conjecture, therefore, that the original structure was a Buddhist monastery, but later in date by several hundred years than the first monastery erected on the terrace No. V. It was of course a quadrangle, encompassing the four sides of the terrace. Nothing remains of it except the massive transverse wall with the buttress, and the lower portion of the retaining wall. The mosque has been erected perhaps on the site of the principal cloister of the monastery, its second division occupying the position of a smaller cloister. The amount of stone material expended on the present comparatively small building is preposterously great, and in itself is a proof that an edifice of much larger dimensions formerly stood here.

STONE PILLAR.

Soná-ká-Talao.

Before closing this paper, we would direct attention to a stone pillar standing in the midst of a tank between the city of Benares and the Buddhist remains at Sarnath. The tank is called Soná-ká-Talao, or the Golden Tank, and is situated on the opposite side of the river Burna, near the road which branches off from the high road leading to Ghazee-pore, and almost close to the point of its junction with several other roads. The road is a portion of the Panch-kosi or sacred boundary of Benares. Proceeding along it for somewhat less than a mile, you arrive at the tank, which is to the right of it, and is approached by a strong and well built ghaut, on which are several Buddhist figures, brought most probably from Sarnath. It is three hundred yards in length, and one hundred and forty in breadth. In the midst of it is a round pillar, eighteen feet high and upwards of nine in circumference, composed of great blocks of stone cut in quadrants and put together without cement or mortar. There is no inscription on the pillar, and no mason marks, so that we have been totally unable to assign any date, even approximately, to its erection. Its base is always, we believe, surrounded by water; yet it would be worth while to ascertain whether any inscription exists below. We probed it to its foundations, but found no face for an inscription. It is likely that both the pillar has somewhat sunk, and that formerly the tank was less choked with mud than it is now. In appearance therefore the pillar was once higher than at the present time. It was probably surmounted formerly by a lion or some other figure, and on close examination bears marks of extreme old age.

Besides allusions to a few other ancient structures, we have in this paper traced out remains, more or less abundant, of six Buddhist vihárs or monasteries and four Buddhist chaityas or temples, still existing in Benares, and have pointed out the sites on which they stood or are still standing. Add to these the remains at Bakarya Kund already described in a former paper, and we have the remains of seven monasteries and at the least seven chaityas. The monasteries are doubtless a portion of the thirty monasteries and upwards which Hwan Thsang, the Chinese traveller

of the seventh century, said existed in Benares in his day. In conclusion, we may remark that we are much inclined to believe that many of the ancient Buddhist monasteries, and of the temples also, were on a line of road leading from Bakarya Kund to Raj Ghaut Fort in one direction ; on a second line, at right angles to this, running from Bakarya Kund to Sarnath ; and on a third, proceeding from the site of Aurungzebe's mosque and joining one or both the others, possibly, at Bakarya Kund, and that hereabouts most of other remains of such buildings, if found at all, will be discovered.

Note by the Rev. M. A. Sherring.

Since the above was written, I have visited and examined the country lying on the banks of the Ganges to the north of the river Burna. To my utter astonishment, though I must confess, not contrary to my anticipation, I found brick and stone debris scattered over the fields for, as far as I could conjecture, five miles or thereabouts. In many places the rubbish lies thick upon the ground, choking up the soil, and to a large extent the deposit can be traced continuously. Here and there small bits of sculptured stone are visible, and occasionally, where the broken bricks and stones are in very great abundance, they have been collected into ridges or small mounds. This is especially manifest at the termination of the deposit at a spot called Patharaká Siwán, where, in ancient times, doubtless stood a large fort, of which the foundations may even now be partially traced. Although the fields beyond this point seem to be clear of rubbish, yet further on, at Mūskábád, at the distance of a mile, it recommences and becomes as thick as in any other place. Perhaps this latter was the site of an outlying town.

But what are we to say of these remains? They lie immediately on the great river's bank, and never retreat from it more than three quarters of a mile. It is, I think, very evident that all the way from the mouth of the Burna this bank has been, with the lapse of centuries, considerably cut away. Indeed, I believe, that as much as a quarter of a mile may have gone into the river. In all probability therefore the space covered by debris was much broader than it is at present. There can be no question, however, that here a great city once stood. I have no hesitation in expressing my belief that in the

entire absence of any *bonâ fide* Hindu remains in the present city of Benares, dating from even the Buddhist period, not to speak of the pre-Buddhist epoch, when we know from historical records that Benares was in existence, the ancient city of the pre-Buddhist and early Buddhist eras must have occupied this site. Beyond the northern extremity of the remains of the ancient city is a series of mounds also covered with debris, tending in a north-westerly direction, where formerly forts or towns existed. I think it not unlikely that in a far distant age the connexion of the ancient city of Benares with Sarnath was along the course of these mounds. Sarnath is spoken of in the Ceylon records as though it may have been a city of itself; and there is no doubt that it is referred to in ancient documents as a part of Benares. Now, modern Benares is at least one-third of a mile to the south of the Burna, whereas Sarnath is out in the country about three miles to the north of that stream. If we suppose, however, that Benares, in its most ancient period, was mainly on the north side of the Burna likewise, and if such supposition is corroborated by extensive remains of ancient buildings in the shape of brick and stone debris stretching over several miles of country, as already shown, and terminating in mounds lying in the direction of Sarnath, the proof approaches to demonstration that in that early epoch a union, more or less intimate, existed between Sarnath and Benares, as stated by historical records. I had no opportunity to examine thoroughly the country lying between these remains and Sarnath, but I feel satisfied that at some point in these remains a line of debris would be found connecting the two spots, with only a few breaks in its course, the debris indicating the former existence of solid buildings and being the broken remains of the same. This point must not be searched for at the southern extremity of the ancient city, but at the northern extremity; and perhaps the line of junction may be the line of the mounds just now referred to; but of this I am not able to speak positively.

If these observations respecting the site of the early city be correct, it would follow that the derivation of the word Benares, as the city lying between the Burna and the Assi, is utterly absurd, as applied to the most ancient city. That it is a correct derivation of the word, as denoting the city of modern times even as far back as the Gupta dynasty, and perhaps somewhat further, I have not the smallest

doubt. But Banâr-assi has nothing whatever to do with ancient Benares, and as applied to it would be a ludicrous misnomer. It seems, indeed, probable that the Buddhists were the first people to occupy to any extent the southern side of the Burna, and such a notion is remarkably substantiated by the existence of various Buddhist remains there, as described in this paper; but none of them, so far I know, date from earlier than the Gupta period. The Panch-kosi road or sacred boundary of modern Benares, nearly fifty miles in extent, and regarded by many natives as of immense antiquity, is no older than the city which it encompasses, and must also be assigned to a comparatively recent date. Many pleasant and perhaps hallowed associations connected with Benares, as it now stands, will in the minds of multitudes be in danger of being snapped asunder, when they discover that the Benares of to-day was not the Benares which their forefathers knew.

Assyro-Pseudo-Sesostris.—By HYDE CLARKE, Esq. Member of the German Oriental Society, of the Society of Northern Antiquaries of Copenhagen, of the Academy of Anatolia, of the Institution of Engineers of Vienna, Local Secretary of the Anthropological Society.

[Received 13th July, 1865. Read 2nd August, 1865.]

As the monument near Ninfi (the ancient Nymphæum), and twenty miles from Smyrna, has of late years become a subject of some controversy, I have been very desirous of getting it photographed, and at length this has been effected (Plate XXI.) by the zeal and ability of Mr. Alexander Svoboda, an artist doubtless remembered by many members of the Society for his paintings of Indian scenes, and his having first photographed the caves of Elephanta and the monument of Ctesiphon, as he has latterly those of Ephesus.

Herodotus, in his second book, as is well known, speaks of the foreign wars and expeditions of Sesostris, and says that he erected various monuments of his victories, of which Herodotus had seen one in Syria, and there were two others in Ionia, one on the road from Sardis to Smyrna, and the other on the road from Ephesus to Phocæa, and that

the figures, four cubits and a spathamus high, held a bow in one hand and a lance in the other.

The words of Herodotus are :—

“The pillars which Sesostris erected in the conquered countries, have for the most part disappeared, but in the part of Syria called Palestine, I myself saw them still standing, with the writing above-mentioned, and the emblem distinctly visible. In Ionia also, there are two representations of this prince engraved upon rocks, one on the road from Ephesus to Phocæa, the other between Sardis and Smyrna. In each case the figure is that of a man, four cubits and a span high, with a spear in his right hand and a bow in his left, the rest of his costume being likewise half Egyptian, half Ethiopian. There is an inscription across the breast from shoulder to shoulder, in the sacred character of Egypt, which says, “With my own shoulders I conquered this land.” The conqueror does not tell who he is, or whence he comes, though elsewhere Sesostris records these facts. Hence it has been imagined by some of those who have seen these forms, that they are figures of Memnon, but such, as I think so, err very widely from the truth.”

Diodorus Siculus repeats the like, and says there was an inscription in hieroglyphics on the monument, of which he gives the translation.

As the monument near Ninfi agrees with the description of Herodotus, it is generally believed to be Egyptian, to bear a hieroglyphic inscription, and to be the Sesostris. As will be seen, there are traces of characters on the right hand corner, though what, cannot be made out. They are exceedingly unlike any hieroglyphic inscription, which will carry the meaning of Diodorus, and the rock is too soft for the minute characters of the hieroglyphic ever to have been carved upon it. It would not bear even the ring of the cartouche.

Who first doubted its Egyptian character, we have not the means here of knowing, but at any rate the geographers Kiepert and Carl Ritter have done so, and in their works the monument is figured as “Pseudo-Sesostris,” and is placed with the Assyrian class.

Unaware of this, some years ago, I visited the monument and arrived at the same conclusions, and I have since endeavoured to obtain the opinions of competent authorities in Europe. This corre-

spondence made me more urgent to get it correctly reproduced, and it is satisfactory that at length it can be examined by all interested in the subject, instead of the very few who could reach Ninfi.

It is reasonably to be doubted whether Herodotus ever saw this monument, because he has not described it with absolute accuracy.

The monument is quite off the road or any high road, and is a very unlikely place for a public monument of Sesostris. It is on a friable rock, and it is a miracle it has been preserved so many centuries. It was perhaps attached to the country palace of some king or satrap, or it may commemorate a battle fought in the glen. It does not bear the appearance of having been an object of adoration.

Its class is not distinctly Assyrian, for it wants the sharp touch of those workmen, and it must always have been of rude appearance.

It is allied to the Assyrian, and is the production of some people of Assyrian character.

The question arises, whether this monument and the neighbouring Niobe, and the other rock-cut pictures, are the works of settled inhabitants, or of an invading or conquering race. The latter seems to be the preferable hypothesis, because in this district, even in the time of Herodotus, there cannot have been more than three, and there are few scattered over the country. Those in this district most probably belonged to some petty kingdom.

With regard to their epoch, they are certainly as old as the Egyptian cities in their neighbourhood. These cities there form a close group, Smyrna, Tantalus, Sipylus and Nymphæum, attesting at one time a population of large and strong cities and a relative civilization.

These cities, as well from identity of remains with those in the South of Europe, as well from the identity of names with those of the Iberian nations, as well as from the fact of their population having endured beyond the Hellenic invasion, I place as anterior to that epoch, and as Iberian in character. This subject I have treated at length in a detailed memoir read before the Academy of Anatolia, the Ethnological Society, and the British Association.

The rock-cut monuments must, to some extent, have preceded the Iberian occupation, or may have been the result of an invasion during that period, proceeding from Cilicia and the south east, that is, from the Semitic district.

As yet the elements for the determination of these pre-historical questions are very few. They are indeed hardly known, and we are not yet in a situation to judge of the ethnology, the monuments, or the mythology either of an earlier or a later age.

There are two elements in particular that exercised a great influence over this region, that have not been adequately studied, the Iberian and the Caucaso-Tibetan. The remarkable discovery of Mr. B. H. Hodgson, communicated to your Society, of a connection between the tribes of the Caucasus and those of the Himalaya and its valleys, opens up new views as to the history of Central and Western Asia, and will in time afford one of the keys for unlocking their secrets, not less valuable perhaps than those applied to hieroglyphics or cuneiform.

I was led by a like train of investigations with Mr. Hodgson to the like results, and I am glad to find that what I have done, has been in confirmation of such an authority. I lately communicated a paper on this subject to the Asiatic Society of London, with the hope of inviting other inquiries.

It is perhaps by means of the Caucaso-Tibetan, that we shall obtain a knowledge of the early history of Iranistan, of the influences which have affected so peculiarly the early Indo-Europeans, the Armenians, the Ossetes and the Koords, of the third arrow-headed, and the Lycian.

It is here we shall perhaps find another element in the determination of mythology, though so far as the mythology of these regions is concerned, and particularly its local character, Iberian sources must be searched. It is there we must seek for the explanation of much of the mythology, and not in Sanskrit sources, however plausible such explanations may appear.

The Hellenes found a mythology ready made for them in the Iberian countries, in which they settled, and they adopted Iberian terms. To a certain extent, they brought with them Indo-European dogmas, and here Sanskrit philology will help us; but the local colony is Iberian. This western country of Asia Minor was, in fact, the seat of mythology and the land of the gods, before the Hellenes appeared. In some cases an Indo-European legend may have been attached to a local site, but the Hellenes borrowed more than they gave.

The Sesostris I propose to designate Assyro-Pseudo-Sesostris.



Notes on some of the temples of Kashmir, especially those not described by General A. CUNNINGHAM, in his Essay published in the Journal of the Asiatic Society of Bengal for September, 1848.—By W. G. COWIE, M. A., Chaplain on duty in Kashmir, during the summer of 1865.

[Received 1st December, 1865.]

In these notes I have followed as nearly as possible the wording of General Cunningham, in his description of the different temples, which he visited in Kashmir.

The temples of Bhaniyar, Wangat, Manusbal, Narayan Thal, Futtehghur, Dyamun, and Lidar do not seem to have been described before. What I have said about those of Pandrethan, the Takht, Pathan, Avantiswami, and Marttand, is meant to be supplementary to General Cunningham's accounts of those temples.

BHANIYAR.

The buildings at Bhaniyar consist of a lofty central edifice, standing in a large quadrangle, surrounded by a colonnade of fluted pillars with intervening trefoil-headed recesses.* The ground plan of the temple is a square of $26\frac{1}{2}$ feet with pilasters at the corners, 4 feet in thickness. The interior is a square of $13\frac{1}{2}$ feet, and the walls are therefore $6\frac{1}{2}$ feet thick, which proportion may be considered a strong proof, according to General Cunningham's† theory, of the antiquity of the building.

The roof was pyramidal, and the total height of the temple, estimated at twice its breadth, would be 53 feet. The lowest stones of the pyramid remain in some places, and their external slope is parallel to that of the sides of the pediments over the doorways. The only entrance to the temple is gained by a broad and lofty flight of steps to the N. N. W. On each of the other sides there is a porch containing a closed doorway.

These porches are just the same as that of the entrance, each being $16\frac{2}{3}$ feet wide, with a projection of one foot in advance of the corner pilasters.

* See Photograph, No. I.*

† See Cunningham, p. 249, para. 6.

* The photographs referred to in this paper are by Messrs. Sheppard and Bourne of Simlah.—ED.

The doorways are surmounted by trefoiled arches, 23 feet high; and the latter are covered by pyramidal pediments, resting on independent pilasters. Within the large trefoiled arches, there are smaller pyramidal pediments, of which the tympanum is occupied with the trefoiled decoration, like that at Bhaumajo,* resting on the architrave covering the pilasters of the doorway.

The pilasters at the corners of the building sustain the entablature, and give a look of strength and solidity to the walls, which was absolutely required for the vast and massive roof.

In the interior the walls are plain, except that (as at Narayan Thalt) a sort of string-course projects all round, about $12\frac{5}{8}$ feet from the floor. It is about a foot high, flat above, and rounded below.

Over the string-course and resting on it, there is, on each side, a semicircular headed recess, about 3 feet high, 2 feet wide, and $1\frac{1}{2}$ feet deep. Only the one at the back of the building, that is, towards the S. S. E., is pierced for a window, the opening being rectangular, and about 2 feet high by 1 foot in width. The roof is hollowed out into a hemispherical dome, of which the centre is decorated with an expanded lotus flower, as in the Payach† temple. The spandrels of the dome are too much injured to show any trace of figures, if any ever existed; but the dome looks as if it were a modern restoration, and the whole is overlaid with thick whitewash, concealing the material of which it is constructed. There were, however, no figures in any other part of the building, except the tympanum of each smaller pediment over the architraves of the doorways; and *there* the remains of heads (for such I took one of them to be)^o are now so much worn away, that it is impossible to say exactly what they represented. The colonnade had *no* such ornaments.§ (Plate XX.)

The basement of the temple is very fine. It is divided into two portions, each having the same style of moulding as that of the Bhaumajo|| basement; but they differ from it in being further projected beyond the face of the wall.

The lower portion is 47 feet square and $5\frac{5}{8}$ feet high; and the upper portion $34\frac{1}{2}$ feet square and 6 feet high, with a projection of 4 feet. Each division of the basement has a massive filleted torus as

* See Cunningham, plate X.

† See below.

§ See photograph, No. II.

‡ See Cunningham, plate XI.

|| See Cunningham, plate VIII.

the crowning member, with a straight fillet above and below. Under this is a dado, or plain straight face, which is a little higher than the torus itself. Beneath the dado, is a quirked ovolo of bold projection surmounted by a straight fillet, and under this is the plinth, of which (as at Bhaumajo) the lower stone projects beyond the upper one. As at Payach too, there is a stone drain or water-spout, open at the top, for carrying off the water used for the service of the temple. It emerges from the building on the W. S. W. side, and projects slightly beyond the upper basement; the termination of the drain or spout being made to represent the open mouth of a large snake or some other animal.

The temple is approached by a flight of twelve steps,* the lower six being 11 feet in width, and the upper six 10 feet, enclosed between sloping walls one foot in thickness. Besides the sloping walls, the lower 6 steps are further supported by flanking walls† (as at Avantiswara,) nearly 6 feet high and $3\frac{5}{8}$ feet thick.

The temple is enclosed by a pillared quadrangle (Plate IX.) measuring inside 145 feet by $119\frac{5}{8}$ feet, the longer sides being to the W. S. W. and E. N. E., containing 54 fluted columns. In the middle of the longer sides of the colonnade, and of that in rear of the temple, there is a pair of large fluted pillars, 12 feet in height and 15 inches in diameter, and 10 feet apart, advanced beyond the line of the peristyle a little more than the corresponding pillars at Marttand. On all these columns the transverse architraves, connecting them with the walls of the peristyle, are still standing. The central porticoes, to which these large pillars belong, are not gateways, but lead only to small chambered recesses, similar to, but a little deeper than, those between the other pairs of pillars. There is, however, one flank entrance to the quadrangle, viz., between the third pair of pillars on the E. N. E. side, to the south of the central porch. This has always been, as it is now, closed with a wooden door.

The quadrangle itself originally contained 48 round fluted pillars (of which all but three are still in their places) and six square parallel pillars (disposed in the corners, and on each flank of the gateway); which, together with the six pillars of the central porches and the two of the gateway, made up 56 in all. None of the pillars now

* See Photograph, No. I.

† See Photograph, No. I.

standing seem to have been injured otherwise than by the wear of time and the elements; but from these causes, many of them have now lost all trace of fluting. Each pillar of the peristyle is 10 feet in height and 13 inches in diameter, with an intercolumniation of $7\frac{1}{4}$ feet. Immediately behind each pillar there is a square pilaster $\frac{1}{8}$ engaged, of the same height as, and with mouldings similar to those of, the square corner pillars. The pilasters are $9\frac{1}{2}$ inches distant from the pillars. Between every pair of pillars there is a chambered recess $7\frac{5}{8}$ feet by 4 feet, with a trefoil-headed arch covered by a pediment, (which pediment) is supported on small pilasters, or rather upon half* engaged pillars, as at Avantiswámi. The general style of the pillars is similar to that of the Marttand colonnade; but it is impossible to say whether the pedimental pilasters of the intervening recesses were ornamented or not. The trefoiled heads of the recesses are joined to the side mouldings of the openings by short horizontal returns† (as at Avantiswámi). Each pillar is connected with its pilaster and with the main wall by a transverse stone beam, which, being broader at top than at bottom, bears the appearance of an upper capital to the pillar.‡ “The greatest and most characteristic distinction,” therefore, as General Cunningham says, “between the Arian and Classic orders, lies in the disposition of the architrave. In the latter it lies immediately over the line of pillars, whilst in the former it is placed over the transverse beams.” Nearly all of this entablature still exists, but the building has been so much injured by the weather, that its character can only be conjectured. It seems to have been much the same as the upper part of that given in No. 2, plate VIII. of General Cunningham’s Essay. The upper part of the roof of the quadrangle has entirely disappeared, but there can be little doubt that it was triangular in section.

The outer walls of the quadrangle are ornamented by fine deep horizontal bands,§ the intervals being occupied by rectangular figures 18 inches high, 13 inches wide, and $4\frac{1}{2}$ feet apart, the whole being surmounted by an entablature of the same design as that of the peristyle. The base of the wall is buried deep in accumulated earth

* See Cunningham, plate XVIII.

† See Cunningham, plate XVIII, and ante Plate IX. p. 92.

‡ See Photograph, (of Marttand colonnade), No. XXIV.

§ See Photograph, No. III

and rubbish; but to the S. W. of the gateway, and on a level with the bottom of the fluted torus which crowns its basement, is part of a similar torus,* or string-course, projecting from, and running horizontally along, the face of the wall. This torus no doubt ran along the exterior face of the whole quadrangle, and is probably still in good preservation below the ground. Lastly, the front wall is ornamented at each extremity with a trefoil-headed† recess covered by a pediment, the latter resting on half engaged pillars, which are flanked by square pilasters $\frac{1}{8}$ (one-eighth) engaged, in every way like those of the interior. The quadrangle has had two large wells in the W. S. W. and E. N. E. corners, probably to supply water for flooding the enclosure; and half way between the steps of the gateway inside and the steps of the temple there is a square structure of stone, cut away in the centre as if to receive the end of a prop to a raised pathway,‡ such as that suggested by General Cunningham as the probable connection between the gateway and the temple at Marttand. The object of erecting temples in the midst of water appears to him to have been "to place them more immediately under the protection of the Nágas, or human-bodied and snake-tailed gods, who were zealously worshipped for ages throughout Kashmir."

The entrance or gateway§ stands in the middle of the N. N. W. side of the quadrangle, and is $25\frac{1}{2}$ feet in width, nearly that of the temple itself. Outwardly the gateway somewhat resembles the temple, in the disposition of its parts and in the decorations of its pediments and pilasters. It is open to the N. N. W. and S. S. E., and is divided into two distinct portions by a cross wall $3\frac{3}{4}$ feet thick, with a doorway in the centre closed by a wooden door. These inner and outer porticoes of the doorway are each $16\frac{1}{2}$ feet wide and $6\frac{1}{4}$ feet deep. Their side walls are decorated each with a miniature temple having a square-headed doorway, surmounted by a pyramidal pediment representing a double roof. The tympanum of each compartment of these roofs is occupied with the trefoiled decoration, common to the Kashmirian buildings, resting on the architrave, as in the doorway pediments of the temple itself. The pediment of the gateway,

* See Photograph, No. III.

† See Cunningham, p. 270, para. 25 and Photograph, No. III.

‡ See Cunningham, page 273, para. 31, and page 287, para. 8.

§ See Photograph, No. III.

outside and in, is supported on half engaged fluted pillars, $16\frac{5}{8}$ feet high, and 14 inches in diameter. As at Bhaumajo, the base of the tympanum* is reduced to two short returns of the horizontal mouldings of the pediment, each of which serves as a sort of upper abacus to the pedimental pilasters. The doorway pilasters, supporting the architrave ($2\frac{1}{4}$ feet high, and broken through as usual in the temples of Kashmir), are as high as the base of the main pilaster capitals, and $4\frac{1}{6}$ feet higher than those of the quadrangle. Besides the doorway pilasters, there are two fluted columns of the same height (including a sort of second capital) and $18\frac{1}{2}$ inches in diameter, one on each side of the entrance, $7\frac{2}{3}$ feet apart, supporting the architrave. The second capital corresponds to the transverse beam of the peristyle connecting the pillar with its pilaster; but here it is detached on all sides. It is cruciform,† and so projects on each side of the capital proper. These columns are distant from the square doorway pilasters respectively about one diameter. The roof of the gateway, like that of the temple, has perished; but it was evidently pyramidal, for the corners of the base of the great pediments (outside and in) remain, and their angles are equal to those at the base of the doorway pediments.

The basement of the gateway is approached on either side by a flight of six steps‡ $7\frac{5}{8}$ feet wide, supported by flank walls $7\frac{3}{4}$ feet in length, and terminating in upright stones,§ each separated by an interval from the main wall, and ornamented with a standing figure, said by the pundits to represent a servant of Siva.

The material of which the buildings are constructed, is a pale, coarse granite, of which there seems to be no quarry within reach on the left bank of the Jhelum. This circumstance is remarkable, considering the enormous size and weight of some of the stones employed. Mr. Drew, a geologist in the service of H. H. the Maharajah, thinks that the blocks of granite must have been carried down some of the valleys on the opposite side into the river bed, whence they were brought for the construction of the temple. Mortar has been used in all parts of the buildings. Opposite the gateway,

* See Photograph, No. III.

† See Photograph, No. III. and Cunningham, pp. 269-70, para. 24.

‡ See Photograph, No. III.

§ See Photograph, No. III.

across the road, there is a large cistern, (like that attached to the central temple of the second group of buildings beyond Wangat*), cut out of a single block of granite. It is $6\frac{1}{2}$ feet long, 5 feet wide, and $2\frac{1}{2}$ feet high. There is another cistern† of the same kind, but of smaller dimensions, close by.

The Hindoos residing on the spot say that the temple was built by one Bonadutt (hence the name Boonyar), whose brother built or began a temple at Venapoora beyond Sopur. The situation is very fine, in a deodar forest on the left bank of the Jhelum, which roars below as it descends in foaming cataracts.* Immediately behind, the pine-clad hills rise precipitously to a great height. About one-third up, there is a strange formation of rock, resembling a human figure, which is said by the pundits to be the petrefaction of an evil spirit, who formerly devoured men and women passing that way. A very holy fakir, they say, fixed the man-eater for ever where the figure is now seen.

After carefully examining every part of the Bhaniyar buildings, I am inclined to think that they are older than the quadrangle at Marttand‡, and of about the same age as the temples beyond Wangat.

They probably owe their escape from the hand of the destroyer to their secluded situation, which is quite off all the old thoroughfares leading from the Punjab to Kashmir, about three miles lower down the Jhelum than Nowshera, on its left bank.

I found no trace of an inscription on any of the buildings.

TEMPLES AT LIDAR.

About half a mile beyond Ladoo, and two miles to the left of the road leading from Pampur to Awantipore, there are two temples, one surrounded by water, (Plate XIV.) and a smaller one, close by, a little higher up the hill side.

The ground plan of the former is a square of 24 feet, with corner pilasters $3\frac{1}{2}$ feet thick and 6 inches projected. There is only one doorway, to the W. S. W. Its head is semicircular, with a pyramidal pediment slightly projected and divided into two portions, of which the upper one is plain, and the other is occupied by a semicircular

* See below, p. 106.

† See Photograph, No. III.

‡ See Cunningham, p. 263, para. 10.

ornament. The apex of the pediment reaches to the top of the cornice, which runs round the top of the walls on the outside. The roof is entirely gone.

The interior is a circle, the diameter of which diminishes from the ground upwards. Four feet from the floor it is $17\frac{5}{8}$ feet. There is a cornice 20 inches high, $9\frac{5}{8}$ feet above the floor. Its mouldings are the same as those of the lowest course of the ceiling of the small temple,* viz. three fillets, like those of the Payach dome,† but that the edge of the middle one is round instead of square.

The diameter of the circle formed by the projecting edge of the cornice is 15 feet. The thickness of the wall at the doorway is $3\frac{2}{3}$ feet. The wall on the inside shows signs of fire having been used, perhaps to destroy the roof, which may have been of wood. The top of the doorway inside is formed by the underside of the course from which the cornice of the interior is projected.

There is a drain on the south side, as at Payach, for carrying off the water used in the services of the temple. The height of the wall outside from the top of the cornice is $10\frac{1}{3}$ feet. The corner pilasters stand on a basement $2\frac{5}{8}$ feet high, and are $6\frac{1}{2}$ inches projected beyond the face of the wall (See Plate XIV.) This basement is carried all round the building, except where it is broken by the doorway; the bottom of the basement being on a level with that of the doorway.

The uppermost course of the basement is nearly flush with the corner pilasters, but the next two courses project $5\frac{1}{2}$ inches beyond the uppermost one.

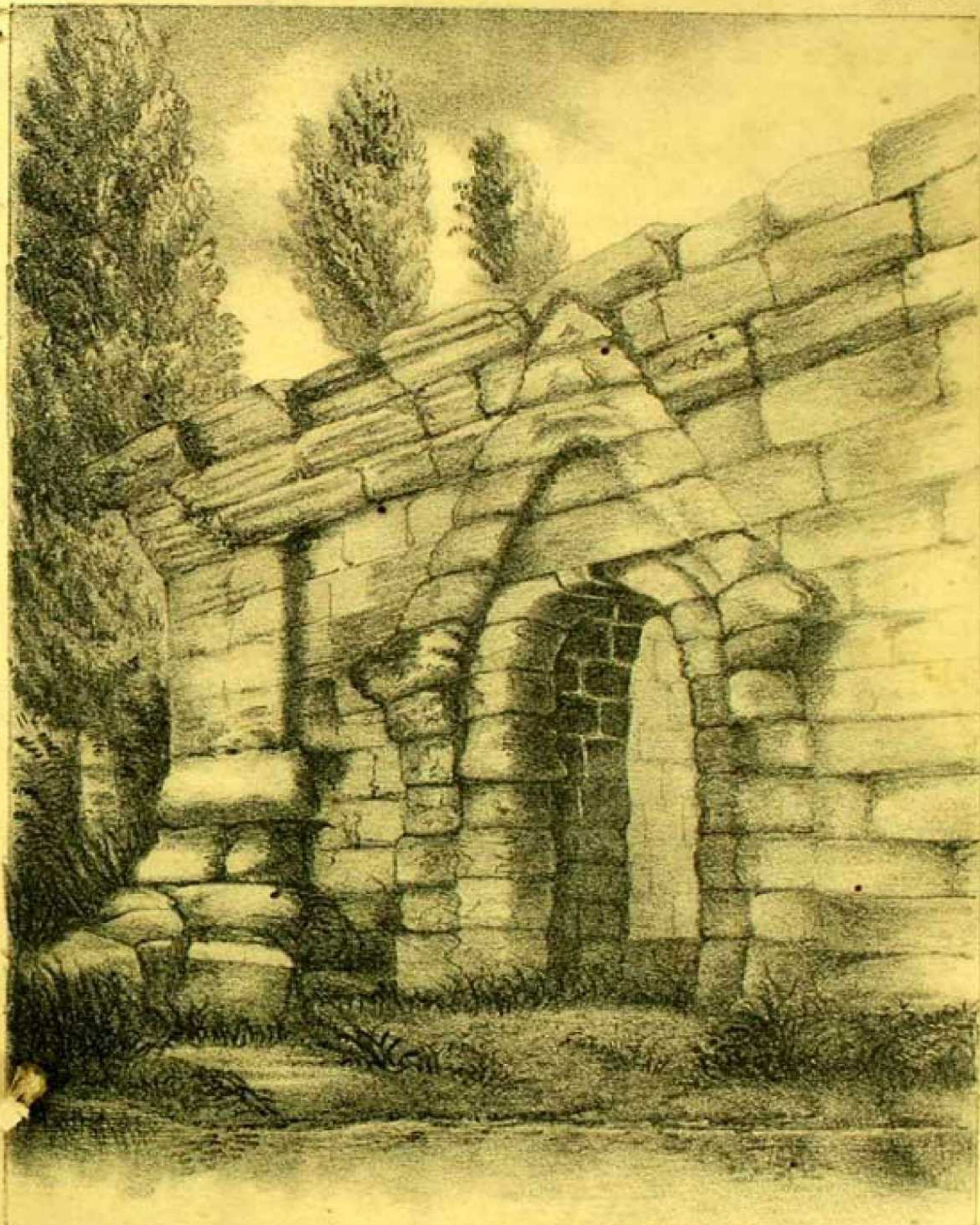
The basement of the temple stands on a platform 48 feet square, faced with stone walls, forming a sort of lower basement, as at Bhaniyar.‡

The whole stands in the middle of a tank of very clear water, which issues from two springs in the N. E. corner. The tank is now 3 feet deep, but I could not ascertain whether there was a stone bottom below the accumulated mud. The tank has been a square of about 70 feet, with stone walls supporting the bank, now 2 feet above

* See below, p. 100.

† See Cunningham, Plate XI. and page 258, para. 10.

‡ See Photograph, No. I. and ante, p. 92.



Drawn by R. T. Burney Esq^r C. S.

On stone by Krista Hari Das Student Govt. School of Art Calcutta

TEMPLE AT LIDAR (IN WATER)

LITHO BY H. RIVEN SURVEYOR GENERAL'S OFFICE CALCUTTA JULY 1864

the water line, but much injured. Round the tank there are the foundations of walls,* which seem to have formed a square of 100 feet.

There is an ancient looking *lingam* $4\frac{1}{2}$ feet high, $1\frac{1}{2}$ feet in diameter, with 8 flat faces, of dark limestone, standing in the water near the springs which supply the tank. It probably once stood in the centre of the temple, like that at the Takht.

The round head of the doorway outside has a sort of keystone (Plate XIV.), being a projection from the lower face of a stone of the course next above, as in the entrance to the temple at Marttand,† and other Kashmirian arches.

The smaller of the Lidar temples stands a little above and behind (*i. e.* to the north of) the first. Its ground plan is a square of $10\frac{1}{2}$ feet. It has only one doorway, viz., to the west. All the walls have corner pilasters 15 inches thick.

The doorway has a square top covered by a pediment, which rests upon the jambs of the door, the tympanum being occupied by the trefoiled ornament. The trefoil contains a niche which once held a figure. This pediment is covered by another, having a trefoiled tympanum. The trefoiled arch rests, as usual, upon small pilasters on each side of the door, but the pediment is supported upon bold square pillars, which are attached to the building by walls of less breadth and 8 inches long. The temple in front is a plain copy of that at Pandrethan,‡ or perhaps the original from which it was taken. The capitals of the corner pilasters are ornamented with two animals (I think Bulls) standing back to back; and those of the square pillars, supporting the principal pediment, are decorated with a bold flowered ornament. The roof of the building is pyramidal, but its outer facing of stone has disappeared. The walls are $2\frac{1}{2}$ feet thick. The basement is buried. The interior forms a square of 6 feet, the walls being 7 feet high and plain.

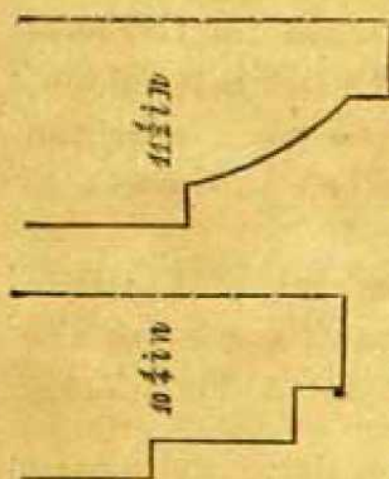
The ceiling is formed of 9 blocks, four of which rest over the angles of the walls. The same process is again repeated with an upper course of four stones, by which the opening is still further narrowed to a square of $2\frac{1}{2}$ feet; and lastly, the opening is closed by

* See Cunningham, p. 288, para. 11.

† See Photograph, No. XXIII.

‡ See Photograph, No. V.

a single stone without ornament. The edges of the lowest course have a plain moulding of three straight edged fillets, (Vide woodcuts) and the upper course a similar one, except that the central fillet is rounded.



To the east and west of the temple are rectangular foundations, of the same width as, and continuous with, that of the temple itself; but there is no trace of surrounding walls. There are, however, numberless hewn stones lying about in all directions. From the position of the building, the ground being high on three sides

it may once have stood in water, like the other temple. The pedestal of a *lingam* remains in the centre of the interior.

BHAUMAJO.*

At Bhaumajo (pronounced Bhoomzoo by the natives) there are two temples, besides that described by General Cunningham. The larger of the two has been appropriated by the Mahomedans for a tomb, and disguised as much as possible; so much so, indeed, that when first I visited the *cave* temple, I did not think it worth while examining this other close by, on account of its new and plastered appearance. It is, however, in a very perfect state of preservation, but its details cannot, at present, be seen on account of the thick plaster with which the building is in most parts overlaid. The pyramidal roof is probably uninjured, but it is buried in a mound of earth surmounting the square Mahomedan roof, which now disguises the nature of the building. With some difficulty, I obtained admission to the interior, which I found to be a square of 8 feet. The ceiling is like that of the smaller temple at Lidar.† There is a door on the north side, but the other walls are covered with plaster, rendering it impossible to see whether they once had doors or not. The third temple, however, on the west of the tomb, has only one door, viz., to the north.

The exterior is a square of $16\frac{1}{2}$ feet, with corner pilasters 2 feet $1\frac{1}{2}$ inches thick. There are porches with high trefoiled arches on

* See Cunningham, page 251, and the Bishop's letter to the Asiatic Society, 1865.

† See ante, p. 99.

all the sides. I could not find out how far the porches project beyond the walls, owing to the plaster; but the one on the river side (where the door is) projects 3 feet beyond the small pilasters which support the doorway pediment.

The intervening spaces between the sides of the porches and the corner pilasters are filled in with mortar.

The small pediment of the doorway within the trefoiled arch is like that of the cave temple,* but is supported on independent pilasters of its own. The porches are 11 feet one inch wide.

To the west of the temple above described, also on the bank of the river, are the remains of a smaller temple of the same kind. Its interior is a square of 7 feet, with a roof like that of the smaller temple at Lidar.† Below the roof is a cornice of three square edged fillets, like those of *both* courses of the ceiling.

The building has, I think, had no corner pilasters. It has porches on all four sides, 5 inches projected. The only opening is on the north side: the other porches containing closed doorways, which, like the porch pediments, are an exact copy of those of the cave temple.‡ The exterior of the roof has been destroyed.

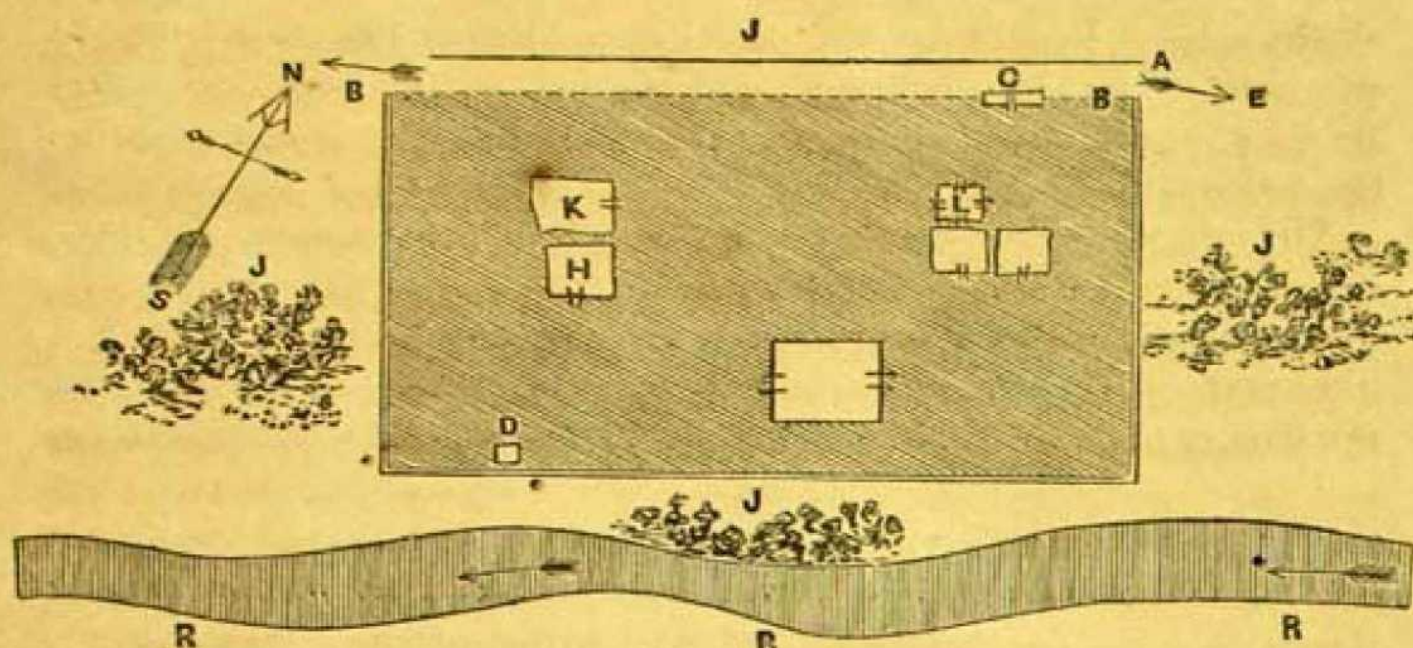
TEMPLES NEAR WANGAT.

About 3 miles above Wangat, on the right bank of the river Kanknai, are two groups of temples of all sizes, more or less in a state of ruin.

The first group, viz., that nearest to Wangat, consists of six temples,§ with a gateway and an enclosing wall. (See woodcut, p. 102.) The ground plan of the principal building is a square of 25 feet, with pilasters at the corners $3\frac{3}{4}$ feet in thickness, and having a projection of two inches beyond the temple walls. There are four porches $14\frac{1}{2}$ feet wide, with a projection of $2\frac{5}{8}$ feet beyond the corner pilasters. On two sides they contain closed doorways, the recesses of which (like those at Pathan||) once held *linga*, whose pedestals are still in their places.

The porches were all surmounted by pediments of high pitch, covering trefoiled arches, which rest on $\frac{1}{4}$ engaged square pilasters. Over each

* See Cunningham, plate X. † See *ante*, page 99. ‡ See Cunningham, plate X.
§ See Cunningham, p. 273, para. 31. || See Cunningham, p. 283, para. 1.



References.

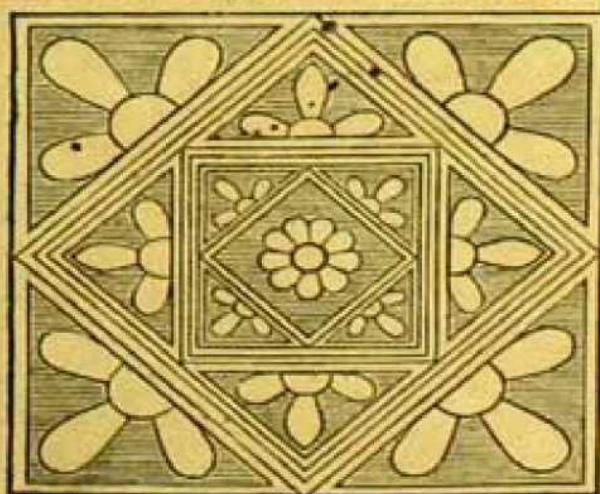
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|---|---|
| <p>A. Massive wall forming facing to hill.</p> <p>B.B. Foundation of original wall of enclosure.</p> <p>C. Gateway.</p> <p>D. Base of lingam.</p> <p>E. Road to second group.</p> <p>H. Temple to west.</p> | <p>J. (On top). Steep mountain side covered with jungle.</p> <p>J.J. (On sides). Dense jungle.</p> <p>K. Temple to west.</p> <p>L. Temple to east.</p> <p>N. Road to Wangat.</p> <p>R.R.R. Kanknai river.</p> |
|---|---|

doorway, within the large trefoil arch, is a pyramidal pediment, of which the tympanum is occupied with the trefoil ornament, resting on the architrave which covers the pilasters of the doorways. The base of the great pediment of the porches is on a level with that of the capital of the corner pilasters, but the upper portions of these pediments have disappeared. There were two entrances, to the E. N. E. and W. S. W. respectively. The former has the remains of short flanking walls (afterwards added, it would seem) projecting $2\frac{5}{2}$ feet beyond the porch. They do not appear to have risen higher than the base of the capitals of the porch pilasters. The roof is still standing, and is pyramidal, but its outer facing of stone has fallen, forced out, probably, by the expansion of the roots of a tall fir and other trees, which grew out of the pyramid. The interior, which has been much injured by fire, is a square of 17 feet, the walls below the cornice being $13\frac{1}{2}$ feet high, and plain; but the roof forms a hemispherical dome, 17 feet in diameter, of which the centre has been decorated by a large expanded lotus flower. The cornice is one foot high, with a moulding of three bands; the upper two projecting each beyond the one below it.

The stones of the interior of the dome diminish in size, from about $1\frac{1}{2}$ feet long and 6 inches wide in the lower courses, to squares of about six inches near the centre. The foundation of the dome is formed of large blocks of stone, about 2 feet high, decorated with three straight edged fillets as at Payach,* the two upper ones broad and projecting each beyond that immediately below it, and the lowest narrowest. The spandrels of the dome are plain and horizontal.

Within a few yards of the principal temple, to the north, there are the remains, more or less ruined, of five small temples, three to the east (L), and two to the west (H and K). *All but one of them are built on the same general plan as the temple already described, but have only one door each. The two to the west have their doors to the east and south respectively. The doorway of the latter (H) is like that of the temple A of the second group, described below. The other three sides of H are decorated each with a miniature double-roofed temple, but without an enclosing porch like those of A. It has a water-spout on the north-west side. The other temple on the west (K) has been a copy of the principal building, without the second doorway.

Of the other three small temples, that corresponding in position to the one nearest the central building on the west, has its door to the south east, and is built on the same plan as H. So has the next one to it (almost touching it) on its north-east side. Its walls have been plain on three sides, and there is a waterspout on the west. The third of these temples, almost touching the first (on its north side), has four doorways; that on the east being larger than the others, with



(I think) a flight of steps to the east. (L). It has a stone water-spout projecting on the N. W. W. side. In the interior the walls are plain. The ceiling (as in the Pandrethan temple,† Plate XVIII.) is formed of 9 blocks, four of which rest over the angles of the walls and reduce the opening to a square. The same process is again repeated with an

upper course of four stones, by which the opening is still further nar-

* See Cunningham, p. 258, para. 10. † See Cunningham, p. 288, para. 10.

rowed to a square of $2\frac{1}{4}$ feet ; and lastly this opening is covered by a single stone, decorated with a large expanded lotus surrounded by a narrow square moulding, whose angles bisect the sides of the upper opening of the ceiling. All the angles are occupied by a flowered ornament of three leaves, something like that of the upper part of the tympanum in the niche of the upper roof at Payach.*

The gateway, about $22\frac{1}{4}$ feet wide, is to the N. N. E. of the principal temple, almost in the N. E. corner of the enclosing wall, and about 30 feet from the nearest of the smaller temples. It was divided into two chambers, and had two columns on each front ; one on either side of the entrance and supporting the architrave, as in the Bhaniyar gateway.† The surrounding wall formed on two sides a facing and support to the platform, on which the temples stand. On one of these sides, viz. that to the east, the wall is over 20 feet high in some places, and is built of small thin dark-coloured stone without mortar. On another side, viz. that on which the gateway is, and the furthest from the river, only the foundation remains ; but 14 feet beyond it there is a second wall, very massive, built of rough blocks of stone, and forming a facing to the hill. It has evidently been erected at a later date, to protect the temples and the gateway from a landslip (probably), which threatened to bury them all in its descent towards the river.

There is built up in this wall a fragment of the pediment of one of the smaller temples. At the S. W. corner of the enclosure there is the base of an enormous *lingam*, $5\frac{1}{8}$ feet in diameter.

From the N. E. corner of the first group of temples there was a road-way flanked with large stones, leading down to the second group, a few hundred yards distant. Half way down, a little to the right of the road, are the ruins of a small solitary temple, but so much injured that it is impossible to make out the original form of the building. Close to it is a block of granite (measuring 10 feet in length, 16 inches in height, and 26 inches in thickness) which seems to have formed part of the facing wall of a resting-place just above it, where the base of a small column is still in its place, at one corner of a rectangular platform. A little further down the road, on the same side, is another rectangular platform, which seems to have been the

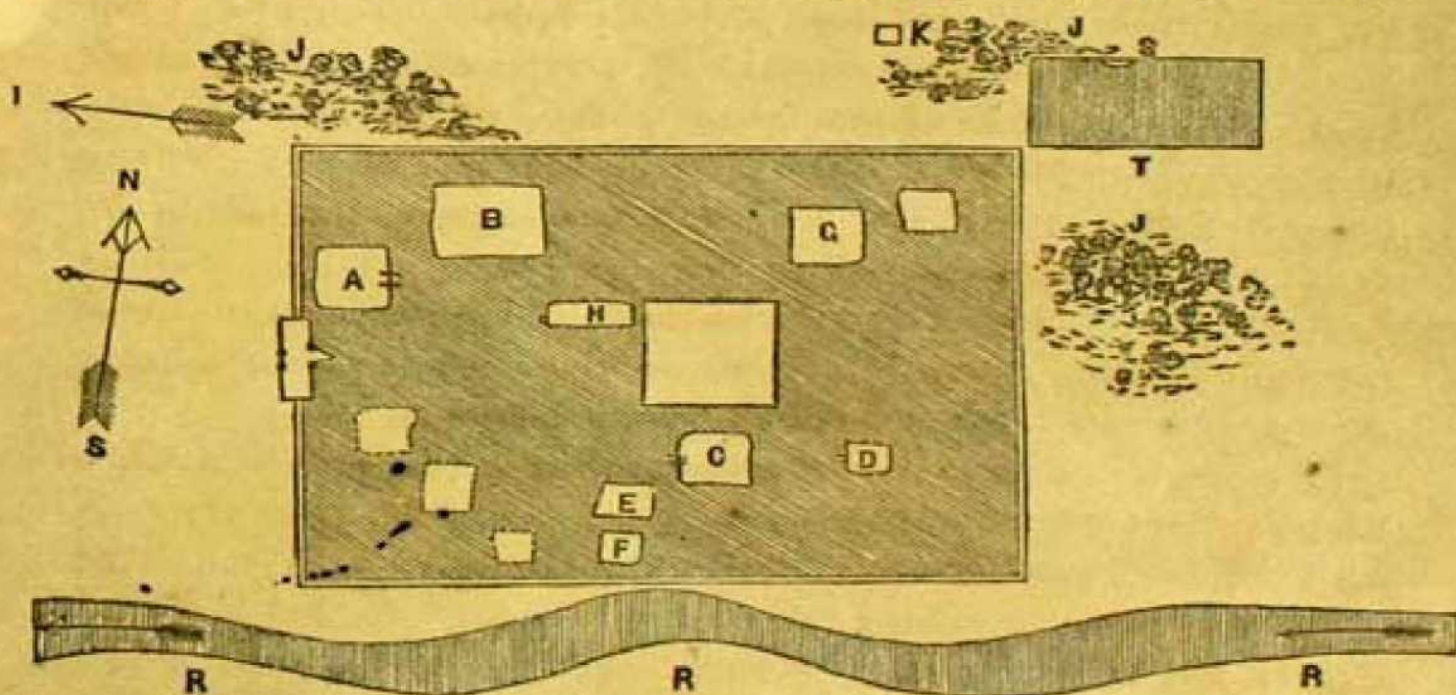
* See Cunningham, plate No. XII.

† See ante, p. 96, and Photograph, No. III.

basement of a *bara durree*, or some such structure, 100 feet long and 67 feet wide. It must have had a broad open verandah all round. The bases of the pillars on one of the longer sides (viz. that to the east), eight in number, are all but one still in their places. The pillars were fluted and two feet in diameter, with an intercolumnation of nearly $12\frac{1}{6}$ feet. Numerous fragments of them are lying about in all directions.

The uppermost course of the basement stones (on which the pillars stood) are 15 inches high, and project about 5 inches over those of the second course (which is almost entirely buried in the ground). In the centre of the platform there are the remains of what appear to have been the walls of an apartment.

About 20 yards to the N. E. of the platform there are the ruins of the enclosing wall of the second group of temples eleven in number, (see woodcut below), with the remains of a gateway in the centre, about $22\frac{1}{2}$ feet wide, similar to that belonging to the first group.* Like



References.

A. to G. Temples.
H. Cistern.
I. Road to first group of temples.
J.J.J. Jungle.

K. Small temple on hill side.
R.R.R. Kanknai river.
S. Spring.
T. Tank.

the latter, it was divided into two chambers, and had flanking pillars to the front and rear, like those at Bhaniyar.† Their

* See *ante*, p. 104.

† See Photograph, No. III.

bases on the river side are still in their places. Immediately inside the gateway, to the left, are the ruins of a small temple A, like those of the first group. Its only entrance, a trefoiled arch covered by a pediment resting on independent pilasters, looks to the N. E. i. e. in the direction of the central building. Over the doorway pediment, and resting on square pilasters, is another trefoiled arch, occupying the tympanum of the porch pediment. The square pilasters project 15 inches, and are attached to the building by short walls, as at Pandrethan.* The other three walls are ornamented with similar porches, projecting about 6 inches, and containing each the front of a miniature temple with two roofs. The recesses once held *linga*.† The interior is blocked up with the debris of the roof.

Between A and the principal temple, and a little to the north of them, are the ruins of another temple (B), of which the basement alone remains, amid a heap of huge stones, earth, and jungle. The ground plan of this building was a square of about 18 feet with corner pilasters 2½ feet thick, and four porches projecting about 14 inches beyond the pilasters.

Close to the central and principal temple, at its N. W. corner, is a huge cistern (like those at Bhaniyar†), cut out of a single block of granite, 15 feet long, 7½ feet wide, and 3 feet high, with a projecting spout on the W. S. W., one of the shorter sides.

The central building here is much more injured than that of the former group, and is buried half way up the porches on two sides. It appears, however, to have been very much like the corresponding temple of the first group, but it had only one entrance, viz. towards the W. S. W. facing the gateway.

The interior is a square of 17 feet. The lowest course of the dome, consisting of 8 stones, each 22 inches high, has not the mouldings which the other dome has in this place, but seems to have had one narrow plain moulding at the edge, and above it there is a concave course, about 18 inches high, with a moulding resembling the frieze of entablature No. 2, (of Marttand), given by General Cunningham on plate VIII accompanying his Essay. The entrance has the remains of projecting walls§, like those of the large temple in the first group,

* See Cunningham, plate XXI. † See Cunningham, p. 283, and plate No. XX,

‡ See ante, p. 97.

§ See ante, p. 102.

The corner pilasters of this temple are 4 feet thick, the ground plan being a square of 25 feet, as in the other case. A few yards to the S. S. E. of the central temple is a small one (C), seven feet square, with one round-headed doorway $3\frac{5}{8}$ feet wide, having mouldings the same as those of G, and looking in the same direction as that of the principal building. On the other three sides, there are similar porches with closed square headed doorways. The basement (of which part only is above the ground) seems to have been like that of Bhaumajo.* The entablature over the doorways, beneath the base of the pyramidal pediment, like the entablature over the corners of the building (on each side of the pediment) is decorated like frieze No. 2, of the Marttand entablature, shewn by General Cunningham. The porches project $4\frac{1}{2}$ inches. The interior is a square of $4\frac{2}{3}$ feet. The roof is constructed of horizontal courses, like these of L. (Woodcut on p. 102.) The uppermost stone is decorated with an expanded lotus flower. The two lower courses are ornamented each with a moulding of three square-edged fillets, like those of the Payach dome.†

To the N. N. E. and S. S. W. of this small temple are the ruins of two others. That in the former direction (D), a mere heap of ruins, had its only entrance on the same side as that of the central temple. The other (E) is a heap of huge stones, scarcely one of which is in its original place. Eight feet behind the S. S. W. temple is a fourth small one (F), with a square headed doorway which has plain perpendicular and horizontal mouldings. There are similar doorways on the other sides, but only that on the N. N. W. has an opening. The interior is a square of $5\frac{1}{2}$ feet. The roof has been formed of horizontal courses, of which the lowest alone remains, forming a square opening of about 4 feet. The walls are 20 inches thick.

There has been another small temple to the S. S. W. of that last described, but it is now only a heap of stones; and on its N. W. side I think there are the foundations of one, if not two, more temples.

To the N. N. E. of the central building are the ruins of a very elegant temple (G), the interior of which formed a square of about 9 feet. The walls were plain, with a cornice of 3 horizontal bands, the centre one having a rounded edge. The walls are $2\frac{1}{2}$ feet thick.

* See Cunningham, plate No. X.

† See Cunningham, plate No. XI.

The only entrance is to the S. S. W. The head of the doorway is round, and has a few parallel and perfectly plain mouldings, which are joined to the similar mouldings of the sides by short horizontal returns. To the N. E. of the last, and a few feet only distant, are the ruins of another small temple, the ground plan of which was a square of $6\frac{1}{4}$ feet.

The wall enclosing all of these buildings, has been plain and very massive. Many of the stones are still in their places on the N. N. W. side, some of them being 7 feet long, 22 inches high, and 22 inches thick. The wall measures 161 feet by 118 feet, the longer sides being towards the river and the hill respectively. On the former side the wall forms a support to the platform on which the temples stand; and on the latter, a facing to the hill side, which has either been cut away to form the quadrangle, or has subsequently come down in a landslip, threatening to bury all the buildings in its descent towards the river. Wherever the lower part of the wall remains and is visible on the outside (as it is near the gateway), there is a string course, like that at Bhaniyar.*

Immediately beyond the enclosing wall, at its N. N. W. corner, is a tank (T) of most delicious water, very cold and clear. The bottom of the tank is considerably above the level of the quadrangle, which might therefore have been kept flooded from the tank. The water issues from the hill on the N. W. W. side of the tank, through the stones of the wall, and was probably the cause of this site being selected for all these buildings. Not only the temples, but the neighbourhood is now forsaken by all human beings, and there is not a *resident* Hindu for many miles. But the spring (S) still runs on the same as ever, affording another instance of the temporary nature of man's greatest devices compared with that of things not human.

To the west of the tank, and the north of the second group of temples, on the hill side, and almost buried in the ground, are the ruins of a small solitary temple. The roof is broken into two portions (like that of the Payach temple†), of which the upper one, a pyramid formed of a single stone $2\frac{1}{2}$ feet square, is still in its place.

The situation of the two groups of buildings is very wild and secluded, but not grand like that of the Bhaniyar temple.

* See *ante*, p. 94, and Photograph, No. III.

† See Cunningham, plate No. XII.

They are on the right bank of the Kanknai river, about 3 miles above Wangat, and not on the Brahimsur stream, where the latter place is incorrectly marked in the trigonometrical survey map. The Kanknai is nearer to the temples than the Jhelum is to that of Bhaniyar, and is quite as noisy as the latter river, but its dimensions are much less. The mountains on both sides of the stream above the temples rise to a great height and are very steep. They are covered with forests of pine and fir; and, not far distant to the N. N. E., the head of the valley is closed by a bare, dark green hill, with the snow still remaining in its clefts on the 27th of July. The temples are built of a coarse, pale granite, like that used at Bhaniyar, and mortar is found in most of the buildings. There are tall firs growing out of the roof of the principal temple of each group, and many of the smaller temples have been much injured by other trees forcing their way through the walls.

The best way to the temples from Srinagar is by Gundurbul, Kuchnungul, and Wangat.

DYAMUN, BETWEEN NOWSHERA AND URI.

On the left bank of the Jhelum, between Nowshera and Uri, and about $3\frac{1}{2}$ miles from the latter place, are the ruins of a fine temple and gateway, similar to those of Bhaniyar.* There has been also a surrounding quadrangle, but very little of it remains.

The ground plan of the temple is a square of 23 feet, with corner pilasters $2\frac{5}{8}$ feet thick and six inches projected beyond the walls of the building. The porches, of which three contain closed doorways, are each 16 feet wide, with a projection of $1\frac{3}{4}$ feet. The doorways have square heads with plain straight mouldings, and are surmounted by pediments containing the trefoil ornament. The pediments are supported on half engaged fluted pillars. The only entrance, viz. to the W. N. W., is approached by a flight of steps like that of Bhaniyar.†

The interior is a square of 12 feet, but is nearly filled up with the debris of the pyramidal roof. The interior walls had a cornice of three plain mouldings, like those of one of the larger temples at Wangat.‡ Part of the pyramidal roof is still standing. It has been

* See *ante*, p. 91, and Photographs, Nos. I. II. III. and XIII.

† See Photograph, No. I.

‡ See *ante*, p. 102.

very massive, but hollow. The basement of the temple is like that of Bhaniyar,* but a good deal of it is concealed by earth and jungle.

The steps of the temple are about $19\frac{1}{2}$ feet from those of the gateway, but the latter are covered with earth and fragments of stone.

The exterior face of the surrounding wall has been ornamented like that at Bhaniyar,† and there were two recesses in the corners of the front wall, like those at Marttand and Bhaniyar. The colonnade of the interior has entirely disappeared, if any ever existed. I found no fragments of small columns, like those of the Bhaniyar peristyle; but the quadrangle is so filled up with earth, fragments of stone, trees and jungle, that whole pillars may be concealed from view. I think there was a peristyle; because behind the temple I found part of a basement, like that on which the columns of the peristyle stand at Bhaniyar.‡

The gateway is built on the same plan as that at Bhaniyar,§ and is $23\frac{1}{2}$ feet wide. It is divided into two compartments, each 17 feet by $5\frac{1}{2}$ feet. The short side walls of each compartment are decorated with two trefoil headed niches, one above the other, with pyramidal pediments. The upper part of the gateway has disappeared, but fragments of the four large fluted columns which supported the architrave, are lying about in the neighbourhood, and also the capital of one of these columns, elaborately carved with small figures and flowered ornaments. Nearly the whole of the outer wall of the quadrangle is still standing, but its character is concealed, in most parts, by the earth which on three sides is up to the top of the wall. The whole of the ruins are so buried in jungle that I passed along the road, on my way to Kashmir, without noticing them at all. The material is black stone (I think limestone), streaked with veins of white marble.

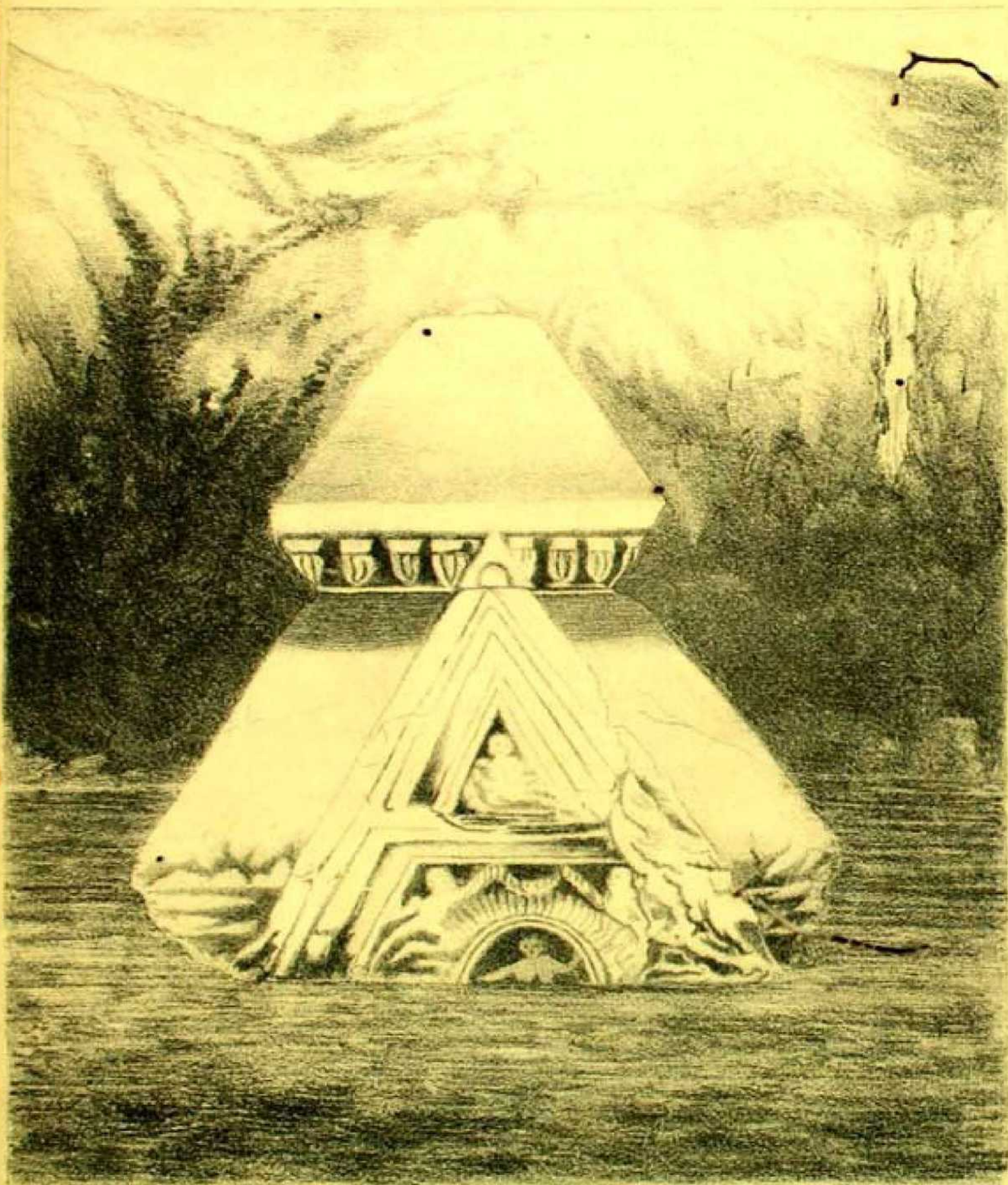
The situation is wild, like that of the Bhaniyar temple, the hill rising to a great height immediately behind the ruin.

MANUS BAL.

At the S. E. corner of the lake of Manus Bal, there is a small temple, of which the roof only was above the water on the 9th of

* See Photograph, No. I.
† See Photograph, No. III.

‡ See Photograph, No. II.
§ See Photograph, No. III.



On stone by Krieto Hari Das Student Govt. School of Art Calcutta.

TEMPLE IN LAKE AT MONUSBAL

LITHO BY H. NIVEN, SURVEYOR GENERAL OFFICE CALCUTTA JULY 1886

August. (Plate XIX.) In the winter, I was told, the building stands on dry ground. At other seasons the whole is sometimes below the surface of the lake.

The roof is very like that of the Payach temple,* being broken into two distinct portions by an ornamental band; each portion being formed of a single stone. The upper stone is 5 feet square at its base, and is plain on all sides. The ornamental band† is like that of Payach, divided into spaces alternately projecting and retiring. The latter are square and occupied by the lotus; but the projecting ends are carved into upright mouldings, slightly rounded at top and bottom, and surmounted by a straight and horizontal band. The north, south, and east sides of the lower portion of the roof are plain. The top seems to have been crowned by a melon-like ornament, of which the base only remains.

The temple appears to be a square of about 6 feet, and has only one doorway, to the west, covered by a pyramidal pediment, which is divided into two portions by a horizontal return of the side mouldings, as in the case of the Marttand colonnade.‡ The upper portion is occupied by the head and shoulders of a figure holding a sort of staff in the left hand, and with something, which I could not make out, under the left arm. (See Plate XIX.) In the niche (like those at Payach§) formed by the trefoil over the doorway, there is a sitting figure, holding a sort of club in the left hand. The angles of the lower portion of the doorway pediment, below the horizontal moulding and above the trefoil, are occupied each with a naked figure leaning against the head of the trefoil, and holding up over the arch a sort of waving scarf, which is passed on through their other hands.

LANKA.

On Lanka island there are the ruins of a very fine temple. Its ground plan appears to have been a square of $34\frac{1}{2}$ feet, with a sort of antechamber to the S. E. E., which is 11 feet wide, including the walls. The latter are $2\frac{5}{8}$ feet thick. This antechamber projects $5\frac{3}{4}$ feet beyond the walls of the Naos. The exterior walls of the temple are ornamented with two rows of deep niches with cinq-foiled

* See Cunningham, plate No. XII.

† See Cunningham, plate No. XII.

‡ See Cunningham, plate No. XVI.

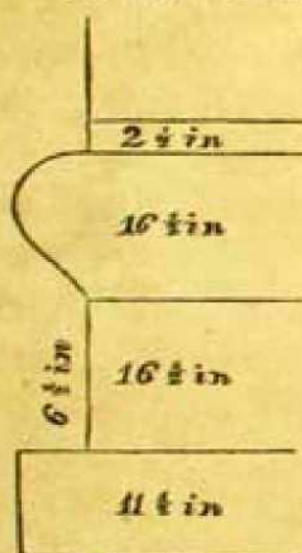
§ See Cunningham, plate No. XII.

heads, flanked by half engaged fluted columns. The wall on each side of the antechamber has three of these niches in each row, *i. e.* 12 niches in all.

There are many small pillars lying about, almost uninjured, and more fragments of similar pillars. The columns measure 8 feet $6\frac{1}{2}$ inches, including base and capital, the latter being like that of the small pillars of the Marttand* peristyle, but with beading between the egg-shaped ornaments. The capital of these pillars is $14\frac{1}{2}$ inches in height. They have 6 flutes, and their diameter is $16\frac{1}{2}$ inches. The exterior face of the walls of the antechamber have only one of the niches in each row.

The doorway is to the S S. E., but I did not feel sure that there had not been doors on the other sides also.

On the S. S. E. side of the island there is a flight of steps with flanking walls; and close by, in the water, a large *lingam*. There are heaps of hewn stone on all sides of the island at the water's edge, including fragments of square headed doorways, pyramidal pediments, &c., and I think the island must all have been surrounded by a quadrangular wall, with a peristyle and recesses on the interior, as at Marttand.



Near the steps are the remains of a cistern like the smaller one† at Bhaniyar. The building stands on a basement, of which a woodcut is given in the margin.

NARAYAN THAL.

This temple stands in a small tank‡ on the right hand side of the road, going from Baramula to Mozufferabad, and about $2\frac{1}{2}$ miles to the S. W. of the former place. It is situated in a hollow at the foot of the hills, and is buried in trees; and it may, therefore, easily escape the notice of travellers who are not looking out for it. The temple is a square of $13\frac{1}{4}$ feet, with plain walls. There is only one doorway $3\frac{5}{8}$ feet high, and 3 feet wide, on the east side, its top being formed

* See Cunningham, plate No. XV, and plate No. VII, fig. 6.

† See ante, p. 97.

‡ See photograph, No. XVII.

by the ends of two stones, whose lower corners are rounded off, forming an arch one foot high. The walls are formed of eight courses, of which two are below the surface of the water.

The roof of the temple is a low pyramid, also formed of eight courses, of which the lowest projects a few inches beyond the face of the walls. The second course from the top of the roof is formed of one stone, $4\frac{3}{4}$ feet square at the bottom, and $1\frac{1}{4}$ feet high. Over it are three small stones, forming the uppermost course, of which the centre is pierced with a hole, 6 inches in diameter, apparently made to receive the end of a finial that is wanted to complete the pyramid.

The interior is a square of $7\frac{1}{4}$ feet, and is $9\frac{5}{8}$ feet high. The floor was in July more than a foot below the surface of the water. The inside walls are formed of horizontal courses, each consisting of four stones only, one on each side of the building. The course over the doorway is slightly projected and rounded, forming a sort of string course along the walls. Above it are eight courses; the sides of the building diminishing in length as they near the top, and the slope of the walls being straight.

The uppermost course of the interior walls, forming a small square opening, is crowned by a single flat stone.

There are a great many stones lying about the tank, but I could not find the foundation of an enclosing wall,* and, owing to the rushes and other weeds which abound in the water, I could not ascertain whether the bottom of the tank had been flagged or not. I did not find any part of the pedestal of a *lingam* in the temple.

The tank is fed by a running stream, which comes from a spring in the side of the hill immediately behind.

Some of the stones of the temple walls are $9\frac{1}{4}$ feet long and 13 inches high.

FUTTEGHUR, KASHMIR.

After crossing the hill at the end of the valley, about two miles from Baramula, on the way to Nowshera, a short distance off the road, to the left, towards Gul-murg, there are the ruins of a grand temple, in a village called (since Runjeet Sing's conquest of the country) Futteghur. Runjeet had a fort built round the temple,

* See Cunningham, p. 288, para. 11.

using the stone of its pyramidal roof, and probably of its enclosing quadrangle, for the construction of his walls of defence. The ground plan of the temple is a square of $46\frac{2}{3}$ feet. There were four porches, each $27\frac{1}{3}$ feet wide, with a projection $3\frac{1}{2}$ feet beyond the temple walls. The only door was on the W. N. W. side, the other three porches containing closed doorways, like those at Bhaniyar.* The doorways had pyramidal pediments, the tympanum being occupied by the trefoil ornament, and were supported on half engaged fluted columns, with capitals decorated with the egg-shaped ornament.† The doorway pediments were surmounted by those of the porches, with noble trefoiled arches occupying the tympanum; the principal pediments being supported on fine square pilasters, and the arches resting, as usual, on half engaged square pillars of their own. The corner pilasters are $7\frac{1}{3}$ feet thick, and $4\frac{1}{2}$ inches projected. The capitals of the square pilasters, like the entablature of the exterior walls, were ornamented with small trefoil-headed niches, containing naked human figures standing; and over them was a row of lotus flowers in small square panels. The interior measures 29 feet across, and seems to have been octagonal, the four principal sides measuring each $18\frac{1}{2}$ feet, and the other four each 9 feet; but the whole building is buried in earth and the debris of the roof nearly up to the top of the doorways, and it is consequently not possible to take all the measurements accurately. Some of the stones (black limestone?) are very large, measuring $10\frac{2}{3}$ feet in length $3\frac{5}{8}$ feet in height, and $3\frac{1}{8}$ feet in thickness. From the exterior face of the porch to the back of the recess formed by the closed doorway is $8\frac{1}{2}$ feet.

Tewan.

About a mile to the left of the road beyond Bimbaga, at a village called Tewan, near the foot of the hills, there are the ruins of a temple built after the plan of the principal temples beyond Wangat, but of smaller dimensions. It has only one door, viz. to the south; but there are porches, similar to that on the south, on the other three sides, containing closed doorways. The roof is entirely gone, and the walls look as if they would very soon topple over. The basement is buried. The

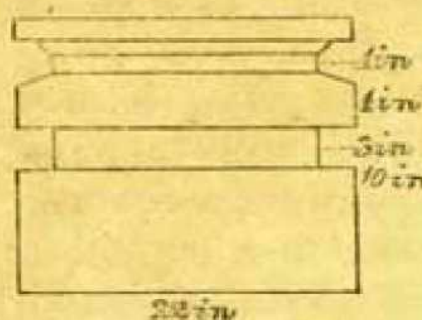
* See photograph, No. I.

† See Cunningham, plate VIII. fig. 6.

interior is a square of about 11 feet. The temple seems to have stood in a tank, and to have had an enclosing wall. Immediately behind is the steep hill side, covered with fine spreading cedars.

TEMPLES AT PATHAN SUGANDHESWARA.*

The inner chamber of this; the smaller of the two Pathan temples, is, as Cunningham says, "quite plain," except that in the west wall there are four small niches in a line, $5\frac{1}{2}$ feet from the floor, two with trefoiled heads and two square-headed. To the right of the gateway ruins there is a fragment of a fluted column, one foot in diameter, like those of the Avantiswami peristyle, and, a little further to the front, a fragment of a larger fluted column (having 20 flutes) $1\frac{2}{3}$ feet in diameter.



Down each flute there is a flat band, one inch wide, slightly projected. Near the latter fragment there are pieces of two trefoil-headed arches, and the capitals (with parts of the shafts) of two of the colonnade pilasters. There is also, on the same spot, the base (22 inches square) of a small column, cut on three

sides only.

SANKARA GAURESWARA.

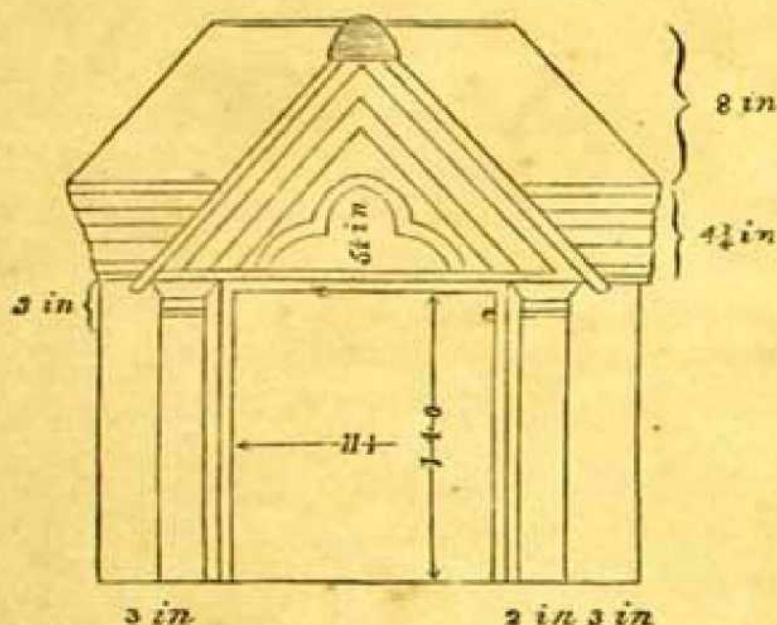
Nearly opposite this, the larger of the two Pathan temples, on the left hand side of the road in a bagh of cherry trees, there is a fragment of a small fluted column† (having 16 flutes), one foot in diameter, similar to that of the Pampur peristyle. The fragment measures about 3 feet in length, and is standing up out of the ground, marking the site of a Mahomedan grave. And in a field to the east of the temple, there is another fragment of the same or a similar pillar. In the village of Pathan, I found the base of a small column like that described near Sugandheswara, and another of a larger column. In and about the village, there are numberless huge stones, squared and otherwise carved, which probably belonged to the enclosure of one or both of the temples. To the east of the entrance porch of the larger temple, at 90 feet distance, there is the foundation of a wall of squared stones, and I thought I could trace the foundation of a gateway.

* See Cunningham, page 281.

† See Cunningham, page 283.

KOHIL.

At Kohil, between Awantipore and Payach, there is a miniature



temple, cut out of one stone, standing near a Mahomedan tomb, within an enclosing wall of recent construction. (See woodcut.) The interior of the temple is a cube of 15 inches, with the centre of the roof hollowed out into a dome; and the walls are 5 inches thick.

The exterior walls are 2 feet long without corner pilasters, and there is only

one entrance. On three sides there are closed doorways, with pediments like that of the entrance. The apex of the doorway pediment is on a level with the top of the lower division of the roof, as at Payach,* and projects 5 inches beyond the roof at the same level. As at Payach, also, the pediment is unbroken, and contains the trefoil ornament. The doorway pilasters project one inch beyond the face of the wall. The basement of the temple, and the upper division of the roof are missing.

At the same place there are the bases of 3 small columns, whose diameter has been 8 inches. Of their bases, the plinth is 7 inches high and $11\frac{1}{4}$ inches wide. The upper member also is square, and somewhat like that of the Marttand peristyle columns,† 3 inches high.

DRUBGAMA.

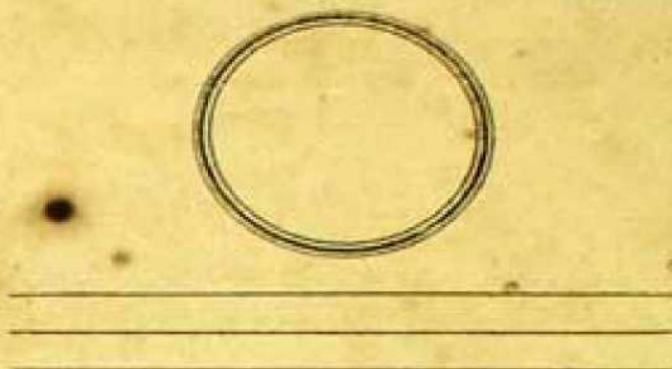
Between Ramoo and Shapuyon, a few yards from the road, on high ground, near Drubgama, is a miniature temple, like that at Kohil, cut out of a single block of stone 2 feet $8\frac{1}{2}$ inches square, and 4 feet $5\frac{1}{2}$ inches high.

It has one door to the south, with a horse shoe-shaped arch, covered by a pyramidal pediment, broken into two portions by a return of the

* See Cunningham, plate XII.

† *Ibid*, plate XV.

side mouldings. The upper portion is occupied by a small trefoil ornament, and the lower one contains a small round ornament, resting on the base, thus :



The width of the porch on the south side is 2 feet. On the north side there is a recess like those of the Pathan temples,* with a cinquefoiled head, covered by a pyramidal pediment broken into two portions of which the lower one is occupied by a flowered ornament. A larger pediment supported on half engaged pillars surmounts the former one. The east and west walls have porches very slightly projected, with pyramidal pediments resting on the jambs of square-headed doorways. The tympanum of the pediment is occupied by a large trefoil ornament.

The roof of the temple has been formed of two stones, of which the upper one has disappeared, as is the case in the Kohil model.

The temple seems to have stood in a very small tank faced with stone walls. I could not find any trace of a basement. In front of the temple there are stones which I took for the foundation of a small rectangular building.

PANDRETHAN.†

The floor of this temple on the 7th of August was $3\frac{5}{12}$ feet below the surface of the water, and above it there were $5\frac{1}{2}$ feet of wall. The opening on the south‡ (differing from those on the other three sides) appears to have been made subsequently. Its sides are not splayed like those of the other doorways, and seem not to have been regularly cut, but rudely broken away. In fact, one stone on the west side of

* See Cunningham, p. 283, para. 1.

† *Idem*, page 283.

‡ *Idem*, p. 287, para. 9.

the opening is not flush with the rest, but projects a couple of inches or so beyond the general level of the face of the wall. I think there had been originally a closed doorway outside on the south, like those at Bhaniyar* and that the interior of the wall on that side was originally built up and plain.

General Cunningham's drawing of the ceiling of the temple is not quite complete. From the accompanying very accurate sketch made by Mr. R. T. Burney of the Civil Service, (Plate XVIII.) it will be seen that the angles of the square in which the beaded circle is, are occupied by naked human figures, as well as the angles of the other squares. These innermost figures have both arms outstretched, like those at Payach† seeming to hold up the circle. They have drapery about their shoulders, resembling light scarfs. The brackets supporting the cornice were once ornamented, and show marks of great violence having been used to destroy the carving. Each appears to have represented a human head; for on several of them there still remains on both sides what looks like plaited hair. The pediment pilasters project 5 inches beyond those supporting the trefoiled arches. The corner pilasters of the building are 1 foot 10½ inches thick. I found what I took for mortar in all parts of the building.

MARTTAND.‡

The middle chamber of the centre edifice is 14 feet by 6½ feet; and the innermost one, the naos of the Greeks, is 18 feet by 13½ feet, having the remains of a cornice, about 18 inches high, in the S. E. corner. I could find no trace of trefoil-headed panels or any other ornament on the outer walls of the quadrangle.

The large pillars at the extremities of the wall (in which the gateway is) outside, have, I think, supported the pediments of cells like those in the front wall at Bhaniyar.§

The leading feature of the entablature of the middle chamber is the cinquefoiled headed arch, resting upon small half engaged hexagonal pillars. See woodcut on next page.

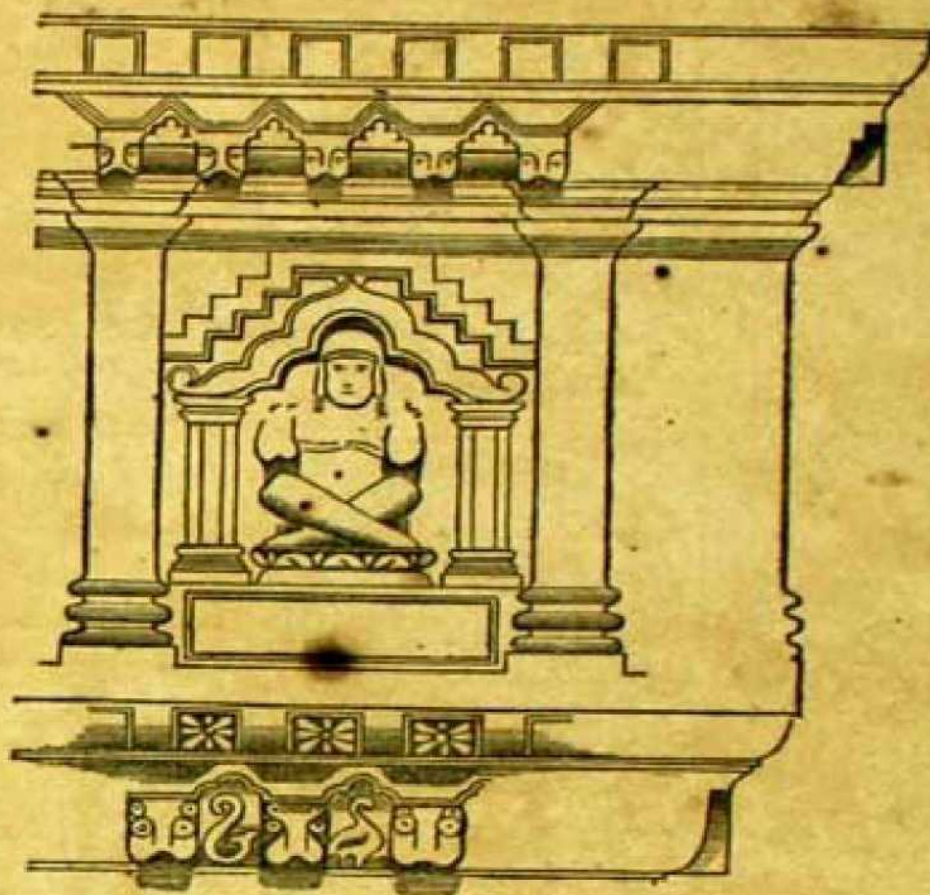
* See *ante*, p. 92.

† Cunningham, plate No. XII.

‡ Ibid, page 258.

§ Ibid, p. 270, para. 25, and Photograph, No. XXIII.

The soffits of the arch, leading from the arddhamandapa or porch, to the antarala or mid-temple, is highly decorated. (See Cunningham, plate XVI. and woodcut overleaf.)



TAKHT-I-SULIMAN.*

With all deference to General Cunningham, I should call the ground plan of this temple a *square*† of $14\frac{3}{4}$ feet, with projections on each side.

The diameter of the interior of the temple is $15\frac{1}{6}$. The thickness of the wall on each side of the door is $5\frac{5}{8}$ feet, and the doorway is projected 2 feet.

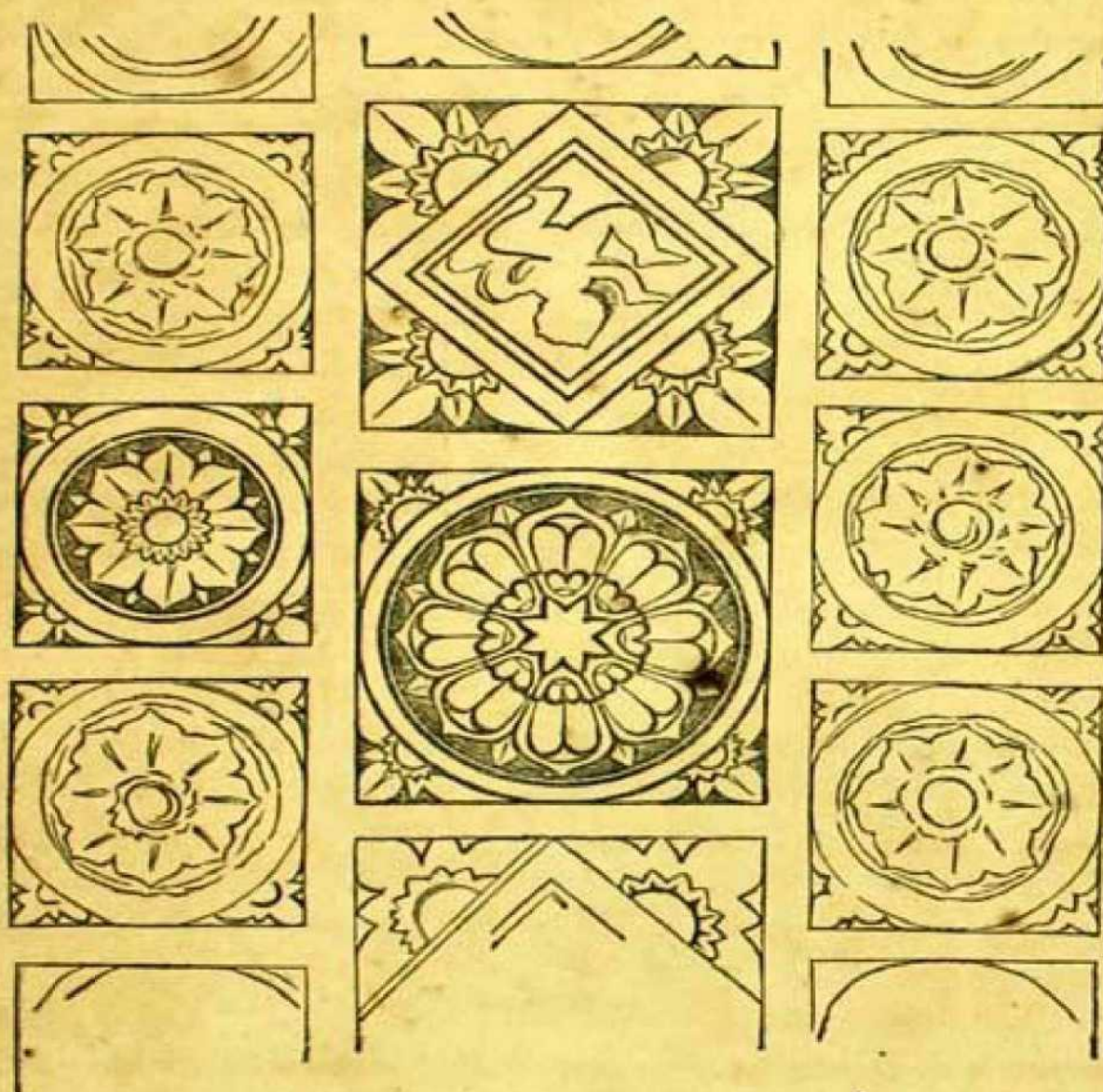
Only one side of the enclosing wall is perfect; and it contains 14 rectangular recesses. The wall on another side is partly standing, and seems to have contained 13 recesses. These walls each measure 22 feet in length on the inside. The outside of the wall is quite plain.‡

* Cunningham, page 247.

† Ibid, p. 270, para. 25, and Photograph, No. XXI.

‡ Ibid, p. 250, para. 18.

The basement of the wall is $2\frac{1}{2}$ feet thick, projecting on the inside one foot beyond the wall itself. The height of the basement is 10 inches.



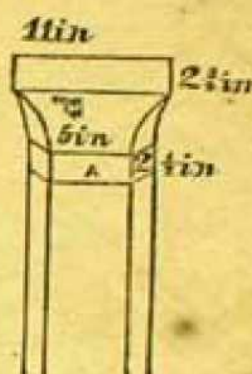
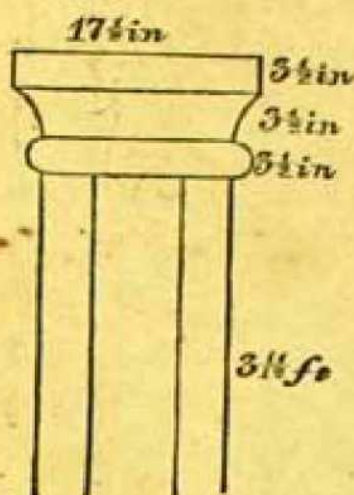
(Soffits of entrance arch of Temple. Marttand.)

The sloping walls, flanking the steps leading from the entrance, are $2\frac{3}{4}$ feet thick. The surrounding walls and the entrance are in much better preservation than the temple itself. The entrance has a round top (like those of the arched recesses in the rectangular panels*), whereas the doorway of the temple is narrow and pointed. For these and other reasons, I believe the surrounding wall and the steps to be much more recent in date than the temple.

* See Cunningham, p. 250, para. 8.

I was assisted in taking the above measurement by W. Elmslie, Esq., M. D.

To the north of the temple, a few feet distant, there is a small rectangular building. Its interior is 11 feet by $10\frac{5}{8}$ feet, and the



walls are $2\frac{7}{8}$ feet thick. The roof is formed of large plain slabs, supported on four horizontal stone beams, 15 inches wide, and $6\frac{1}{2}$ inches high. Each of these beams is formed of two stones. These beams again rest, in the centre, on another stone beam (formed of 2 pieces) $10\frac{5}{8}$ feet long, 11 inches high and 16 inches wide,

and supported on two stone pillars (of 8 flat faces each) without bases. Including the capitals, the pillars are 4 feet $10\frac{1}{2}$ inches high and $23\frac{1}{2}$ inches thick. (See woodcut.) The capitals are not alike.

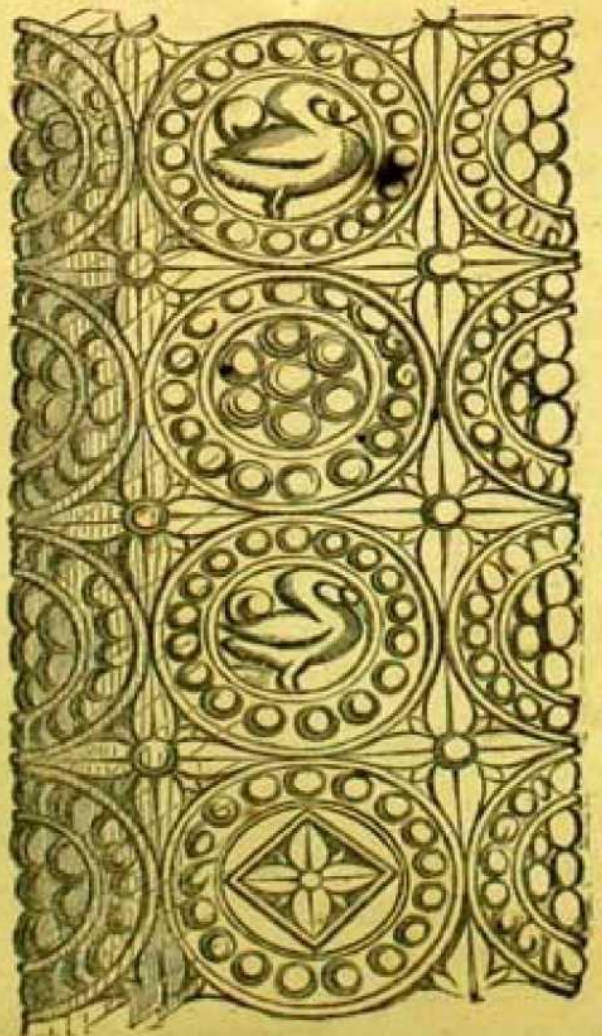
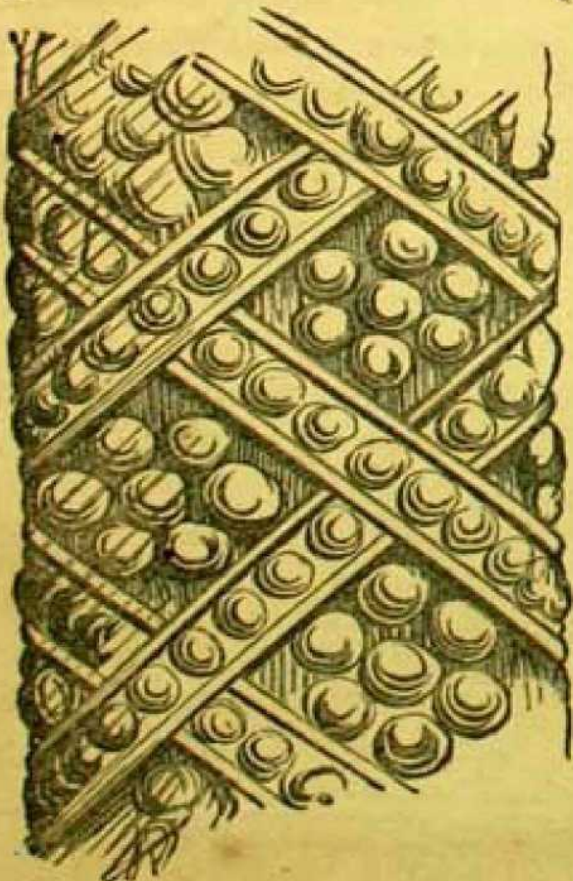
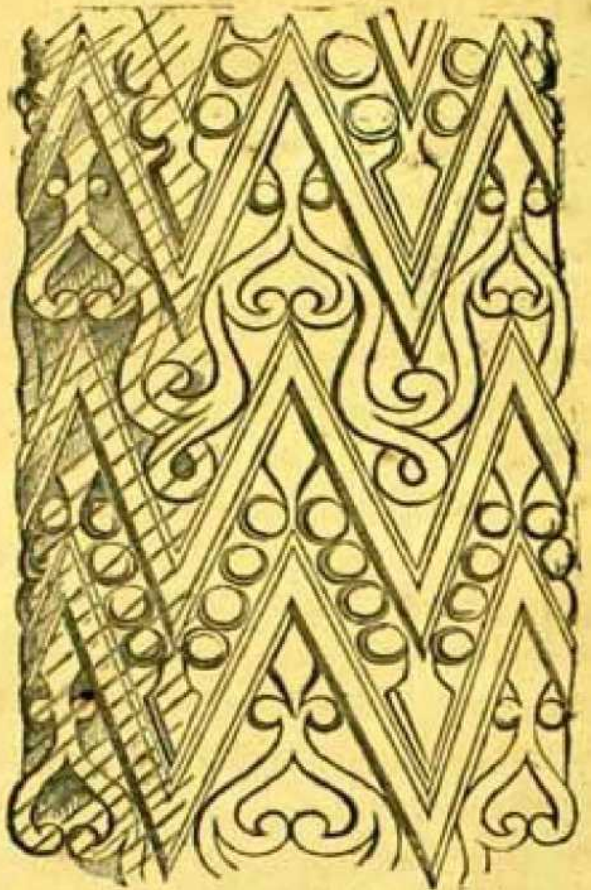
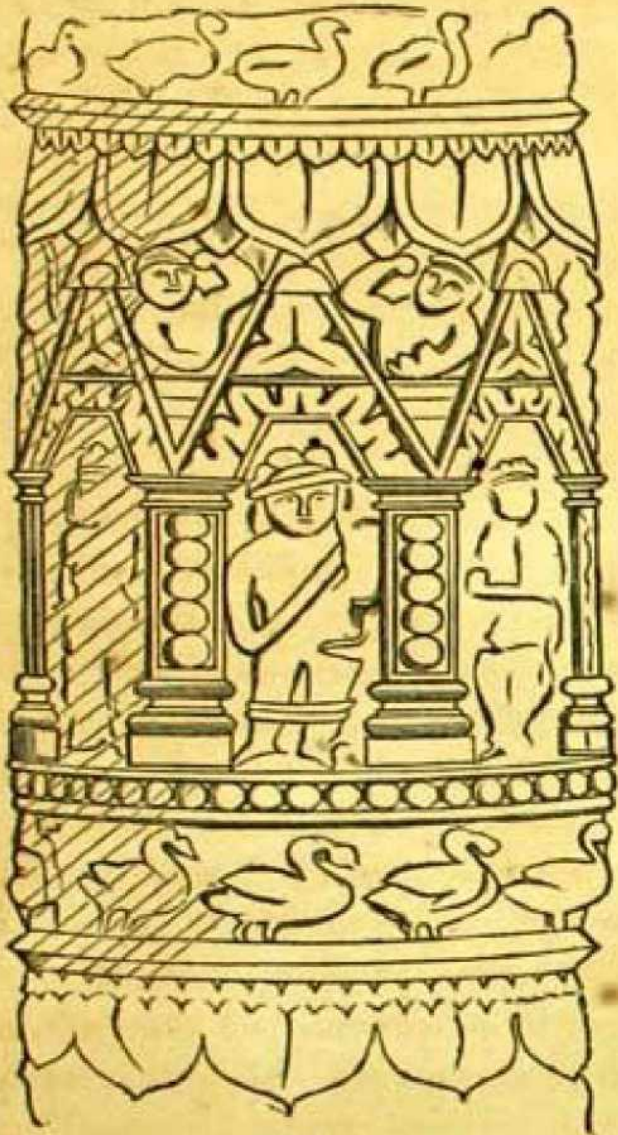
There is one entrance to the east, as in the temple close by. It is round headed, with plain mouldings parallel to the sides and top. The walls outside and inside are plain. The exterior of the roof is gone.

AVANTISWAMI.*

Though the Dewan at Srinagar readily consented to my opening up the ruins of Avantiswami, I experienced great difficulty in obtaining bildars and coolies for the work. For some weeks I could not get any at all, and most of the work was done by very old men and children.

I excavated the whole of the peristyle on the south side of the quadrangle and the part of it between the S. W. corner and the gateway. At first I hoped that the displacement of the entablature over the colonnade was only local; but, on continuing the excavation,

* See General Cunningham's Essay, p. 276, and the Bishop's letter to the Asiatic Society, 1865.



I found that the whole of the entablature on the south side had been thrown down before the silting up of the quadrangle. Notwithstanding this circumstance, the pedimental pilasters of the recesses have scarcely been injured at all. This is specially remarkable in the case of one pair of pilasters, which are ornamented with figures representing Siva or some other divinity. The woodcuts on page 122, from a drawing by Mr. H. Wilson of the Civil Service, give a very faithful representation of four of these pilasters.

KUNAMOH, &c.

At Kunamoh and Kroo, beyond Pampur, to the left of the Islamabad road, there have been temples in the middle of small tanks, which (latter) still remain. At Tapur also, between Pathan and Baramula, there are the foundations, if not the entire basements, of two fine temples; and near Woossun, on the right bank of the Sind, there are likewise extensive ruins of similar buildings.

About one mile from Baramula, on the left bank of the Jhelum, are the foundations of a wall 90 yards square, enclosing a small *tope*. This is probably the ancient Jayendra Vihar. Near the wall there are the foundations of a large village or city. Stones of all shapes are strewn over the ground to the extent of some acres. In one place there is a heap of huge blocks, which are evidently the debris of a temple long ago overturned. There is also a small mound resembling a Buddhist *tope*, also covered with loose stones. Near its top is a very large *lingam*. A few hundred yards from this mound, in an orchard, there is another and larger *lingam*, measuring 17 feet in circumference near the base, and 9 feet in height.

Remarks on Barbier de Meynard's edition of Ibn Khordádbeh and on the Land-tax of the empire of the Khalyfs.—By Dr. A. SPRENGER.

[Received 23rd February, 1866.]

Le livre des routes et des provinces d' Ibn Khordádbeh, texte arabe publié, traduit, et annoté par C. Barbier de Meynard. Paris, 1865.

Monsieur Barbier de Meynard is known to us as the author of the *Dictionnaire Géographique de la Perse*, and as the editor and translator of the *Travels* of Ibn Baṭūṭā and of the *Golden Meadows* (or more correctly, as Gildemeister explains this book title, "the gold washings) of Masúdy. To these important publications he has lately added that of Ibn Khordádbeh, and at present he is engaged with *Moqaddasy*. As soon as he has completed this work, we may say that he has done more for oriental geography, than all Arabists past and living together. Barbier de Meynard has visited the East, and he is an 'Alamdyda and a man of vast erudition. His way of working differs essentially from that of his confrères of the old rotten school. He gives us good texts and close yet elegant translations, and does not waste his time in puerile notes, replete with philological subtleties and nonsensical explanations, in which men whose ideas do not extend beyond the narrow limits of the school, delight so much.

The most ancient MS. of the geography of Ibn Khordádbeh is that of Oxford, which has hitherto been considered as unique. To the zeal of Monsieur Barbier de Meynard and to his knowledge of the East we owe the discovery of another copy, which was found at Constantinople. Notwithstanding this important discovery, it was an extremely difficult task to establish a good text of Ibn Khordádbeh. I do not maintain Barbier de Meynard has succeeded in every instance to fix the correct reading, but I assert, without fear of contradiction, that no Orientalist could have done more for amending the text than he, for no man has a better knowledge of Eastern geography. The editor suffered under one great disadvantage: he could not consult the MS. of Oxford, whilst the work went through the press, and the transcript which he made use of was not taken by himself. The Oxonians are as jealous of their literary treasures as an eastern prince of the hundreds of ladies in his harem, and as they have no particular

predelection for Eastern lore (they have in fact better things to do), they derive about as much advantage from them. I copied the Oxford MS. for my own use, and in some instances I prefer my own reading. Baron de Slane published in the "*Journal Asiatique*" an account of Qodáma's work on the *Kharáj*, a book which I shall frequently quote in this paper. I might probably have avoided many mistakes arising from the incorrectness of my extracts from Qodáma, if I had had the good fortune to consult the Baron's remarks, but unfortunately I do not possess the *Journal*.

Ibn Khordádbeh wrote about A. H. 250 (A. D. 864.) His geography is small, and fills only 127 pages octavo, but it is of immense importance, inasmuch as it consists almost exclusively of official documents, and contains the caravan and dawk stations of the whole empire of the Khalyfs, and the amount of revenue of every district. I have inserted his itineraries in my "*Post-und Reiserouten des Orients*," and some of them will be taken from that compilation and embodied, as Mr. Hyde Clark writes to me, in Murray's *Guide for the East*. I therefore give here a short account of the revenue of the Khalyfs, extracted from Ibn Khordádbeh.

I must premise a few remarks on the weights and measures of the Arabs, making use of the researches which I made on the weights in my *Leben und Lehre des Mohammad*, Vol. III. p. 141, and in an essay on the *Wegmasse und Gradmessung der Aegypter, Griechen und Araber*, which is not yet published.

The standard of the Musulman weights is the Aureus of Constantine: $72 \text{ Aurei} = 1 \text{ Roman pound} = 5256 \text{ English grains Troy according to Gibbon,} = 5165 \text{ grains de Paris according to Böckh.}$ The Aureus, considered as the unit of weight, is called *Mithqál*, and may be taken $\Rightarrow 4.6 \text{ Grammes}$ or somewhat more. This weight of pure gold is according to the present value of the precious metals $= 15.97 \text{ Francs.}$ The Musulman Dirham is in weight $= \frac{7}{16} \text{ Mithqál,}$ and if consisting of pure silver, its value is $= 72 \text{ Centimes.}$ 1 Baghdádian roll pound (the one mentioned in law-books) $= 128\frac{1}{2} \text{ Dirhams} = 90 \text{ Mithqáls} = 1\frac{1}{4} \text{ Roman pounds} = 409.536 \text{ Grammes} = 1.1 \text{ pound Troy (nearly).}$

All other Musulman weights we must reduce, if possible, to the *Mithqál* ($= \text{Dynár} = \text{Aureus}$); for there existed various systems:

the grain and the weights, calculated by the number of grains which they contain, had, in some parts of the empire, and at one time, a greater or lesser value than in other parts and at other periods. There is a grain of which 72 make a Mithqál, there is a grain (شعيرة) of which 100 make a Mithqál, one of which 96 make a Mithqál, one of which $68\frac{4}{7}$ make a Mithqál, and one of which 60 make a Mithqál, but this grain is called *Habba* and not *Sháyra*. The fact seems to be that the Persians, and after them the Mohomedans, found that the Roman *Aurei* are more equal in weight than any other coin, and for this reason they used it as standard, calculating the value of their own weight by *Aurei*. In some cases, slight alterations in the value of their own weights seem to have been made in order to adapt them better to this foreign standard. The apothecaries' weight, as we learn from Avicenna, was Greek, but not without some alteration.

According to the Dictionary of Techn. Terms, p. 176, there existed in the early ages of the Islam the same system as was in later times preserved at Samarqand. It may be expressed as follows :

Mithqál.	Daneq.	Tassúj.	Habba.	Grain (Sháyra.)
1	6	24	48	96
	1	4	8	16
		1	2	4
			1	2
				1

Another system or Çanja we find in the Qámús under *Makkák*, it may be expressed as follows :

Mithqál.	Dirhem.	Dáneq.	Qyrát.	Tassúj.	Habba (grain.)
1	$1\frac{3}{7}$	$8\frac{4}{7}$	$17\frac{1}{7}$	$34\frac{2}{7}$	$68\frac{4}{7}$
	1	6	12	24	48
		1	2	4	8
			1	2	4
				1	2
					1

This system is in the Qámús continued beyond the Mithqál, as follows :

Makkúk.	Kaylaja.	Maná.	Rotl (pound.)	Ounce.	Istár.	Mithqál.
1	3	$5\frac{5}{8}$	$11\frac{1}{4}$	135	225	$1012\frac{1}{2}$
	1	$1\frac{7}{8}$	$3\frac{3}{4}$	45	75	$337\frac{1}{2}$
		1	2	24	40	180
			1	12	20	90
				1	$1\frac{2}{3}$	$7\frac{1}{2}$
					1	$4\frac{1}{2}$
						1

In this table three systems of weight are brought together: the Roman monetary, the Greek apothecary, and the Persian heavy weights. I ought to observe that the grain of شعيرة in Herat was, even in later times, so small, that 100 such grains were required to make up a Mithqál. In some places 3 Habba made a Tassúj.

I now insert an abstract of the calculations of 'Alyy Hasany, who wrote at Murshidábád in A. H. 1164, transcribed from his autograph.

1 grain of barley = 2 grains of riye = 4 grains of mustard.

1 Másha = 8 Raty = 36 grains of barley = 72 grains of riye.

1 Tola = 12 Mashas = 96 Raties = 9 Dirhams of the law-books = $6\frac{3}{8}$ Mithqáls.

A Paysa (copper coin) of 'Alamgyr has exactly the weight of one Tola, but the Paysa of Bengal, current in 1164, weighs $10\frac{1}{2}$ Raties.

1 Sér of 'Alamgyr = 60 Tolas.

1 Man of 'Alamgyr = 40 Sêrs.

1 Bengal Rupee = 10 Mashas and 2 Raties.

1 Delhi Rupee = 10 Mashas.

1 Ashrafy = 9 Mashas and 6 Raties.

1 Qyrát = $\frac{1}{20}$ of a Mithqál of the traditions = $3\frac{3}{4}$ grains of barley = $\frac{2}{3}$ Raty and $\frac{3}{4}$ grain.

1 Dáneq = $\frac{1}{8}$ Dirhem = 8 grains = 1 Raty and $3\frac{1}{2}$ grains

1 Dirhem = 6 Dáneq = 48 grains = $\frac{7}{8}$ Mithqál = $10\frac{2}{3}$ Raties.

1 Mithqál = $68\frac{4}{5}$ grains = 20 Qyrát = $1\frac{3}{4}$ Dirhams = 14 Raties and $1\frac{1}{4}$ grains.

1 Rotl of 'Iráq = 130 Dirhems = 91 Mithqáls = 6240 grains = $\frac{2}{3}$ Rotl of Madyna = $1380\frac{2}{3}$ Raties.

1 Rotl of Makka = 2 'Iráqy Rotls = 182 Mithqáls = 260 Dirhems = 12480 grains = $2773\frac{1}{2}$ Raties.

1 Modd = $292\frac{1}{2}$ Dirhems = $204\frac{3}{4}$ Mithqāls = 14040 grains = $2\frac{1}{4}$ Irāqy or Baghdadian Rotls = $1\frac{1}{2}$ Rotl of Madyna = 3120 Raties.

According to some, one Modd = $257\frac{1}{2}$ Dirhems.

1 Ġá' = 4 Modd = 1170 Dirhems = 819 Mithqāls = 56108 grains = 12480 Ráties.

1 Korr = 1200 'Irāqy Rotls = $533\frac{1}{3}$ Modd = $133\frac{1}{3}$ Ġá' = 156000 Dirhems = 109201 Mithqāls = 7488000 grains = $2070\frac{1}{10}$ Sérs.

1 Wisq = 60 Ġá'.

The values of Arabic weights reduced to Indian weights in this table, is certainly wrong. It is incomprehensible, how a man in his senses could believe that one Paysa is as heavy as $6\frac{3}{10}$ Dynárs or 9 Dirhems. This error seems to arise from the supposition that an Indian grain is exactly equal to the largest Arabic grain, of which $68\frac{1}{4}$ are sufficient to make a Mithqāl, and $4937\frac{1}{4}$ one Roman pound. Some other data of this table are probably equally incorrect, yet it contains some information which may be useful.

The value of cubic measures for grain is expressed by the Arabs in the weight of the quantity of barley which they contain. At this moment I have no book in which they are explained, and I must refer to dictionaries. Their explanations unfortunately do not square, because the Ġá' and the Maná have different values in different authors. According to Abú Hanyfa 1 Ġá' of Barley = 8 Rotls; according to Sháfi'y = $5\frac{1}{3}$ Rotl; according to the Shy'ites = 9 Rotls; and according to Kolyug = 1170 Dirhams = $9\frac{1}{10}$ Rotls. On the Maná Meninsky says: apud Arabes Hispanos duas libras, apud Asiaticas 260 Drachmas appendebat. Maná ægyptiaca, pondus sedecim unciarum; maná græca, pondus 20 unciarum; maná alexandrina pondus 30 unciarum. (Casiri Bib. ar-hisp.)

The measures of importance for our present purpose are the Qafyz, the Korr and the Jaryb.

1 Qafyz = 8 Makkúk (which is not the name of a weight, but of a cubic measure). Consequently 1 Qafyz = 8100 Mithqāls = 90 Rotls. According to Golius, 1 Qafyz = 12 Ġá's; or if we take the Ġá', with Abú Hanyfa, to 8 Rotls = 96 Rotls.

We find in the Qámús also the following explanation of the Qafyz, نیم و بیه و بیه بدست و دو یا بدست و چهار مد بود النبي باشد

"1 Makkúk = $\frac{1}{2}$ Wayba; and 1 Wayba = 22 or 24 Modds, that is to say Modds of the prophet." And under Modd he says: "According to the people of 'Irâq, the Modd is equal to two Rotls, and according to the people of Hijáz to $1\frac{1}{3}$ Rotl;" and lower down he states the value of the Modd of the prophet at one-fourth of a Çá'. Now if we take the Çá', with Abú Hanyfa, at 8 Rotls, the Modd has as in 'Irâq 2 Rotls, and if we take the Çá', with Sháfiy, at $5\frac{1}{3}$ Rotls, the Modd holds as in Hijáz $5\frac{1}{3} : 4 = 1\frac{1}{3}$ Rotls; and I therefore suspect that in one place two Rotls, in another place $1\frac{1}{3}$ Rotls, were called Modd of the prophet. If we take the Modd at two Rotls, we have for the value of the Qafyz $\frac{2}{3}^4 \times 2 = 24$ Rotls." It is impossible to reconcile this statement with the preceding one.

There are in the Qámús two other definitions of the Makkúk, eight of which make one Qafyz. According to the one, a Makkúk weighs from six to eight ounces, that is to say, half a Rotl or $\frac{2}{3}$ Rotls. It is impossible that this be the value of the Makkúk in question. According to the other statement, 1 Makkúk = $1\frac{1}{2}$ Çá' or 12 Rotls, if we give to the Çá the value of 8 Rotls.

From a passage of Qodáma, it appears that any small measure of corn was called Makkúk-bushel, and that the Makkúk was different in different countries. In the definition of the value of the Qafyz, I think the large Makkúk is meant, and I therefore assume 1 Qafyz = 96 Rotls or Arabian pounds.

The Korr. At this moment I have no access to the Arabic text of the Qámús, but to judge from the Persian translation and from the extracts found in Golius and Freytag, it seems that the Qámús contradicts itself. Freytag, without stating the authority, says, 1 Korr = 12 Wasq (camel-loads) and every Wasq = 60 Çá'. The value of the Wasq or Camel load depends upon the value of the Çá'; it may therefore be 320 or 480 or 540 Rotls. A camel may carry rather more than two hundred weights on either side, and I therefore take 480 to be nearest to truth. A Korr would therefore be equal to 5760 Rotls.

According to the Persian translation of the Qámús, 1 Korr = 6 ass-loads, and one ass-load = 60 Qafyz. Now a donkey carries about half as much as a camel or less, but according to the above statement, 6 ass-loads are = 12 camel-loads. Moreover 60 Qafyz

weigh 5760 Rotls, a burden which no beast is able to carry. It is therefore clear that one Korr contains 60 Qafyz or 12 camel loads of 480 Rotls each. Another statement of the Qámús says, 1 Korr = 40 Irdabb. The Korr is an 'Iráqian (Babylonian), and the Irdabb an Egyptian measure. One Irdabb = 24 Çá' or 6 Wayba. If the Wayba is taken at 24 Modd, and the Modd at $1\frac{1}{3}$ Rotls, these two valuations agree; for $24 \times 8 = 24 \times 6 \times 1\frac{1}{3} = 192$ Rotls = 1 Irdabb. Consequently the weight of a Korr = 7680 Rotls. We must bear in mind that this is a reduction of the largest 'Iráqian measure of grain to Egyptian measure, and it is very likely that the value of the Irdabb is stated in Egyptian Rotls, the weight of which I do not know; we can therefore make no use of this definition of the Korr. Golius gives the value of the Korr, on the authority of the Destúr alloghat, at 7100 Rotls. This approaches to the result which we have just found; the question is only, what kind of Rotl is meant, and by what means did the author arrive at this result.

The Jaryb is defined in the Qámús as follows: 1 Jaryb = 4 Qafyz; 1 Qafyz = 8 Makkúk; 1 Makkúk = 3 Kaylaja; and 1 Kaylaja = $1\frac{1}{3}$ Maná. We see that this statement is a continuation of the one given above in a tabular form; and it seems to be an abstract of a systematical comparison of 'Iráqian weights and measures; and we therefore keep to it. Consequently 15 Jaryb = 1 Korr. I now continue the above table taken from the Qámús.

Korr.	Jaryb.	Qafyz.	Makkúk.
1	15	60	480
.	1	4	32
		1	8
			1

Consequently one Korr is equal in weight to 486080 Mithqáls or 6750 Roman pounds. I ought to observe that Abú Yúsuf mentions a Jaryb of 7 Qafyz, and that he as well as Ibn Sád say that a man may live on a Jaryb of grain one month. I should think that fifty or sixty Roman pounds would be sufficient for the support of a man; and as the Jaryb of 7 Qafyz contains $787\frac{1}{2}$ Roman pounds, I am at a loss, how to explain this statement.

The linear measures of the Arabs are probably not essentially different from those of the Greeks. 1 Háschimite or Royal cubit =

2 Greek feet = 32 Arabic inches = 273.32 lignes de Paris. The Arabs have besides a cubit of 24 inches (the ذراع اليد), and one (the black cubit) of 27 inches; the proportion of the former to the Háschimite cubit is as 3 : 4.

Regarding the square measures I am in the dark. According to an extract from the Akhwánalçafá, inserted by Dieterici in the Zeitsch. d. D.M.G., 1 Jaryb of 10 Qafyz = 3600 Háschimite square cubits. I suspect that there must have existed a Jaryb of $\frac{1}{2}$ of this value or = 6300 Háschimite square cubits = 22700 \square Pieds de Paris. This is, however, a question which ought to be further investigated by those who have better sources.

The history of the finances of the East, as handed down by the Arabs, begins with the Súsánians, but the two accounts which we have of their revenue, are extremely difficult to be reconciled with each other. Ibn Khordádbēh, p. 42, says : وكان جبى الكسري ابرويز من خراج مملكته في سنة ثمان عشرة من ملكه اربعة آلاف الف مثقال وعشرون الف الف مثقال يكون ذلك بوزن الدرهم سبع مائة الف الف وخمسة وتسعين الف الف ثم بلغت جباية مملكته ستمائة الف الف مثقال

Qodáma, in my incorrect extracts from the corrupted text, says : يقال ان كسري ابرويز اجصي ناحية المملكة في سنة ثمان عشرة من ملكه و انما كان في يده ما ذكرناه و سمينا اعماله من السواد و ساير النواحي دون اعمال المغرب لان حدة كان الي هيت و كان ما سمينا من المغرب في ايدي الروم من العين سبعمائة الف و عشرين الف مثقال يكون من الورق ستمائة الف الف درهم

There is no doubt that both accounts refer to the same fact, yet there is only one figure "600 millions of Dirhams" in both identical. This figure appears to me to express the amount of revenue in Musulman Dirhams. Ten Musulman Dirhams are *in weight* equal to 7 Mithqáls, consequently 600 millions Dirhams = 420 millions Mithqáls or 5,833,333 $\frac{1}{3}$ Roman pounds. The first figure of Ibn Khordádbēh is consequently to be read 420 millions instead of 24 millions. At the time of Qodáma 15 Dirhams (silver) had the value of one Dynár or Mithqál (of gold); consequently gold was only 9 $\frac{1}{2}$ times more valuable than silver. It seems, however, that gold had at times a higher rate, and that a pound of gold was equal in value to 10 pounds of silver. 420 Mithqáls of silver were therefore equal to 42 Mithqáls or Dynárs of gold in value. I consequently propose to read in Qodáma 42 mil-

lions instead of 720,000_Dynárs. The only difficulty is caused by the figure of Ibn Khordádbeh, 795 millions Mithqáls (of silver). It is clear that the author wants to say, that after the eighteenth year of Perwyz the revenue increased, and as 795 is a higher sum than 600, I take that this is the highest figure to which the revenue rose during his reign. After these observations I change the figures, and translate the passage of Ibn Khordádbeh as follows: "The Kherāj of the whole kingdom which was gathered for the Chosroes Parwyz in the year 18 of his reign amounts to 420 millions Mithqáls (of silver, read اربعمائة الف الف و عشرون الف). This makes, reduced to the weight of Musulman Dirhems, 600 millions of Dirhems. Subsequently the revenue of his kingdom rose to 795 Mithqáls."

The passage of Qodáma I translate: "It is asserted that Chosroes Parwyz counted in the year 18 of his reign the revenue (for جدایة read ناحية) of his kingdom. He possessed all the provinces which I have enumerated, the Sawád and the other districts, with the exception of the western part of the Musulman empire; for the frontier of his kingdom was Hyt, and the country west of it belonged to the Greeks. He found that the revenue amounted to 42 millions Mithqáls (of gold), this makes 600 millions of Musulman Dirhams (of silver)."

The Musulman Dirham was not known to the Persians, they counted the revenue, as it seems, in Dirhams which had exactly the weight of a Mithqál or of an aureus of Constantine of which 72 made a Roman pound, and for this reason, in the original account which was used both by Ibn Khordádbeh and Qodáma, the sum was stated in Mithqáls. The money was weighed, and of course, if it contained alloy, deduction was made. We are therefore able to calculate the income with great accuracy, it is equal to 172,800,000 Rupees in value. If we reduce it to English money, we must bear in mind that the proportion of the value of gold to that of silver was not the same as in our days. In the Greek empire, it was fixed by law as $14\frac{2}{3} : 1$, and gold was the standard. In the Persian empire, the proportion was probably as $10 : 1$, and I am inclined to believe that in the document which Qodáma and Ibn Khordádbeh used, the amount of the revenue was stated both in gold and in silver. I have already observed that at Qodáma's time the proportion was $9\frac{1}{2} : 1$, and I have shown (das

Leben des Moh., Vol. 3, p. 136) that in Mahommedan law, it is as 8 $\frac{1}{2}$: 1 and even as 7 : 1.

In Persia silver was the standard, in the Byzantian empire gold. The Musulmans made no change : in the provinces which had belonged to the kingdom of the Sasanians, silver remained the standard, and in Syria, Egypt and other provinces which they took from the Greeks, gold continued as the standard. In Makka and Madyna, silver became the standard as early as Omar I., but in southern Arabia the revenue was calculated by Dynárs (Aurei.) The great difference of the value which gold had at Constantinople under Constantine, and which it had in the Sasanian and later in the Arabic empire, throws an unexpected light upon the relative prosperity of the two countries. The fact requires no comment for those who know the elements of Political Economy.

Ibn Khordádbeh begins his geography with a description of the Sawád—Babylonia. Immediately after the Musulmans had conquered that country, 'Omar I. sent 'Othmán b. Honayf to survey it for the sake of assessment. It appears that he measured the cultivated land of every district, and also for the sake of control the whole country *en bloc*. He found that it is from Hadytha in the north to 'Abbadán in the south 125 farsangs long, and from Holwán in the east to 'Odzoyb in the west 85 farsangs wide. The whole surface of cultivated and waste land (عامرو غامر) amounts therefore to 10625 □ farsangs or 136607143 Jaryb. Ibn Khordádbeh (MS. of Oxford) and Qodáma calculate the surface in round figures at 136 millions of Jaryb.

Under the Sásánian king, Qobád b. Fyróz, the revenue of the Sawád amounted to 150 millions Mithqáls (of silver or Persian Dirhams) = more than 2 millions Roman pounds of silver = more than 214 millions of Musulman Dirhams. After the Musulman conquest, 'Omar I. derived a revenue of 120 millions Dirhams from it. This sum is named by Ibn Khordádbeh and Qodáma. Ibn Sád includes the revenue of Jebel and mentions a higher sum, but as two figures are wanting in his text, we cannot make out what he means, his words are مائة ألف ألف وعشرون ألف ألف و ألف (الف) والواق (آلاف) درهم ونصف

I shall speak on the assessment of 'Omar lower down. Here I will only observe that the 120 millions are made up by the land-tax and

capitation. The latter may have amounted to 7 millions: the male population of full age consisted of 500,000 souls, and the poorer classes had to pay 12, the middling classes 24, and the rich 48 Dirhams; supposing one in a thousand paid the highest, and one in a hundred the middling rate of capitation, this tax yielded 7,000,000 Dirhems and the land tax 113,000,000 Dirhems.

We see that the total income which 'Omar I. derived from the land of the Sawád is little more than half of that which it yielded under Qobád. It is not unlikely that 'Omar assessed it somewhat lighter, but the main cause of the diminution of revenue was the decay of the country. Babylonia has some resemblance with Holland, and the Sunderbunds, being the Delta of the Euphrates and Tigris; and it appears that great efforts have been made in former times to drain it and to protect it from inundation by dykes, and in measure as they were neglected, the land was converted into swamps. We find *paludes* in the map of Ptolemy, but they seem to have been of no great extent. The Tigris carries much silt, which is partly deposited in its bed, where it slackens its course, and consequently in the progress of time the bed became higher and threatened to inundate the country. To prevent this calamity, it was dammed in below Baqra, and the course was regulated: it was made straight, so that the water might carry off the deposit. During the reign of Qobád (probably after the time at which he derived so high a revenue from the Sawád) the dyke was broken through below Kaskar, and the neighbouring country was inundated, but the government took no notice. Annshyrwán had the dykes restored and much of the land was recovered. In the year 6 of the Hijra (A. D. 628) both the Euphrates and the Tigris swoll amazingly, and destroyed many of the dykes. King Parwyz showed great energy, and it is asserted that in one day no less than 40 gaps were filled up; yet though he granted great sums from the public treasury for the repairs, he was unable to remedy the evil. A few years later, the Arabs waged war against the Persians. The dykes were in consequence completely neglected, and the swamps gained in extent. The Musulmans, after they had conquered the country, seem not to have paid any attention to the matter, and the Dihqáns—heads of districts—were unable to repair the dykes. Mo'awiya I. sent his client 'Abd Allah b. Darráj to Babylonia as collector, and he seems

to have been the first Mahommedan who recovered some land. Much greater efforts were made by the Nabathean *Hassán*, who was collector under the reigns of *Walyd* and *Hischám b. Abd al-Malik*, and cut two canals to carry off the water. In A. H. 75, *Hajjáj* was appointed governor of *Babylonia*. He represented to *Walyd II.*, that the drainage of the country would cost three millions of *Dirhams*. The *Khalyf* thought he could spend the money more pleasantly on eunuchs and singers, and refused to grant so large a sum. *Moslíma b. 'Abd al-Málik*, a relation of the *Khalyf*, proposed to him to drain part of the swamps, under the condition that he should draw the revenue of the recovered land. The *Khalyf* accepted the offer, and *Moslíma* cut the two canals called *Saylaya*, and raised dykes. He succeeded in recovering a great extent of land, and the peasantry flocked to him to cultivate it. His family continued to derive the revenue from it up to the time of the overthrow of the *Omayyide* Dynasty. The '*Abbáside* *Khalyf* granted it to one of his relations, *Dáwud b. 'Alyy b. 'Abd Allah b. 'Abbás*. His heirs remained for some time in possession of it, but eventually it was considered as one of the crown-lands الضياع السلطانية

In A. H. 75 *Hajjáj* was appointed governor of *Babylonia*, and he ruled 20 years over that country. *Ibn Khordádbeh* says of the financial condition of the country during his sway: "The revenue gathered by *Hajjáj* did not amount to more than 18 millions *Dirhams*, and there was consequently a diminution of one hundred (and two) millions. This was owing to his burning down villages, and to his oppression. Moreover he was obliged to give advances to the cultivators to the amount of two millions, so that only 16 millions reached the public treasury." It seems that the peasantry fled, for under the just '*Omar II.* who ruled in A.H. 99, the revenue of the *Sawád* suddenly rose to 124 millions.

It is a very unexpected fact that at the time of *Ibn Khordádbeh* not only the limits, but also the names of the districts were in the official language precisely the same which had been in use among the *Sásánians*, nay some of them seem to be even more ancient than the *Sásánians*; for we neither find a district called *Baghdád*, nor one called *Madáyin* (*Ctesiphon*). The province in which these two cities lie, is called *Shád-Hormuz* and the district *Kalwadzá*, from an ancient town half way between *Baghdád* and *Madáyin*.

The Sawád is divided into 12 Kúr, provinces, and originally it contained 60 *Tasásyj*, districts, but at the time of Ibn Khordádbeh only forty-eight. The whole province of *Holwán*, containing five districts, was added to *Jebel*. We have seen that Ibn Sád includes in reference to the time of 'Omar I. the revenue of *Jebel* in that of the Sawád. He probably means that of *Holwán* only, which at the time of 'Omar and of the Omayyids may have belonged to the Sawád. The province of the *Tigris*, containing 4 districts, was given to the Government of *Bağra*; and it is very likely that the crops which it had to supply to the State, were destined for the support of the troops stationed there. This, however, can only apply to the time of the 'Abbásides, for in former days they received their supply from *Máh-Bağra* in Persia, which under the Abbásides was placed under another Government. One whole district had become a swamp and disappeared altogether. Two districts (one of them is lower *Behqobád*) had been converted into crown lands after the system of *Khorásán*. In this manner, the Sawád was shortened by 12 districts and reduced to forty-eight.

I insert here a detailed account of the revenue of the Sawád, according to *Qodáma*, and also (distinguished by asterisks) one according to Ibn Khordádbeh. In a very few instances I deviate from *Barbier de Meynard's* text, and follow my own copy of the MS. of Oxford. *Qodáma* says of his account, it contains the income as it stands at present. I take the mean since the year 184, this being the first year of which documents are found in the public offices at *Baghdád*; for the earlier records were destroyed by fire during the disturbances which took place in 183 under *Amyn*, known under the name of *Ibn 'Zobayda*.

Western side of the Sawád watered No. of No. of

by the Tigris and Euphrates. Villages, Barns. Wheat. Barley. Dirhams.

<i>Anbár and Nahr-Ma'rúf,</i>	...	—	—	118,000(?)	6,400	4,000,000
* <i>Anbár (alone),</i>	...	5	250	2,300	1,400	150,000
<i>Qotrobbol,</i>	...	—	—	2,000	1,000	3,000,000
* <i>Ditto,</i>	...	10	220	2,000	1,000	300 (sic !)
<i>Maskan,</i>	...	—	—	3,000	1,000	150,000
* <i>Ditto,</i>	...	6	105	3,000	1,000	300,000
<i>Bádúryya,</i>	...	—	—	3,500	1,000	1,000,000

			No. of Villages.	No. of Barns.	Wheat.	Barley.	Dirhams.
*Bádúryya,	...	...	14	420	3,500	1,000	1,000,000
Nahr-Shyr,	...	....	—	—	1,700	1,700	150,000
*Ditto,	...	...	10	240	1,700	1,700	5,000(sic)
Rúmayán,	...	...	—	—	3,300	3,300	150,000
*Ditto,	...	...	10	220	3,300	3,050	350,000
Kúthá,	...	...	—	—	3,000	2,000	350,000
*Ditto,	...	...	9	220	3,000	2,000	350,000
Darqyt,	...	...	—	—	2,000	2,000	200,000
*Ditto,	...	...	9	125	2,000	2,000	200,000
Jubara,	...	...	—	—	1,500	6,000	1,500,000
*Ditto,	...	...	10	227	1,700	6,000	150,000
The three Zábs,	...	...	—	—	1,400	7,200	250,000
*Ditto,	...	...	12	244	1,400	7,200	250,000
Babel and Khaternyya,	...	...	—	—	3,000	5,000	350,000
*Ditto,	...	...	16	378	—	—	350,000
Upper-Falúja,	...	...	—	—	500	500	70,000
*Ditto,	...	...	15	240	1,500	500	70,000
Lower-Falúja,	...	...	—	—	2,000	30,000	280,000
*Ditto,	...	...	6	72	1,000	3,000	280,000
The two Canals,	...	...	—	—	300	400	45,000
*Ditto,	...	...	3	81	300	400	45,000
'Ayn-Tamr,	...	...	—	—	300	400	45,000
*Ditto,	...	...	3	14	300	400	51,000
Jenna and Bedát,	...	...	—	—	1,500	1,600	150,000
*Ditto,	...	...	8	71	1,200	1,600	150,000
Súra and Barbysiya,	...	...	—	—	1,500	4,500	250,000
*Ditto,	...	...	10	265	700	2,400	100,000
						(rice)	
Banyama and King's Canal,	...	...	—	—	3,500	4,000	112,000
*Ditto,	...	...	10	664	1,500	4,500	250,000
Upper and lower Bús,	...	...	—	—	500	5,500	150,000
*Tithes of lands belonging to the church or charities and from lands called Sanyn situated in various districts,	...	...	—	—	500	5,500	250,000
Forát-Badaqla,	...	...	—	—	2,000	2,500	62,000

			No. of Villages.	No. of Barns.	Wheat.	Barley.	Dirhams.
Forát-Badaqla,	...	...	10	271	2,000	2,500*	900,000
Silhayn, ...	...	...	—	—	1,000	1,500	140,000
*Ditto, ...	...	...	—	34	1,000	1,500	140,000
Rúmistán and Hormuzjerd, ...	...	...	—	—	500	500	20,000
*Ditto, ...	...	...	—	—	500	500	10,000
Nister, ...	...	...	—	—	2,200	2,000	300,000
Ditto, ...	...	...	7	163	1,250	2,000	300,000
Ighár of Yaqtyn, ...	...	...	—	—	2,200	2,000	204,800
*Ditto, ...	...	...	—	—	—	—	200,840

At the junction of the two rivers.

The provinces of Kesker : it is said
the revenue formerly amounted
to 90000 Dirhams, ...

*Kesker and canal of Çillah, Riq-
qat and Reyán, the Kheráj and
all other taxes yield, ...

— 30,000 20,000 270,000

— 3,000 20,000 70,000,000
(and rice)

Nahr Çilla, ... 1,000 3,121 59,000

Eastern side of the Sawád.

Buzurg-Sábúr, ...	...	...	—	—	2,500	2,200	300,000
*Ditto, ...	...	...	9	260	2,500	2,200	300,000
The two Rádán,	...	...	—	—	4,800	4,800	120,000
Ditto, ...	...	...	19	362	4,800	1,800	120,000
Canal of Búq, ...	...	...	—	—	200	1,000	100,000
*Ditto, ...	...	...	—	—	200	1,000	100,000
Kalwádzá and Canal of Byn, ...	...	...	—	—	1,600	1,500	330,000
*Ditto, ...	...	...	3	34	1,600	1,500	330,000
Jádzer, old town المدينة العتيقة	...	...	—	—	1,000	1,500	240,000
*Ditto, ...	...	...	9	116	1,000	1,400	250,000
Galúlá and Halúlá,	...	...	—	—	1,000	1,000	100,000
*Ditto, ...	...	...	5	76	1,000	1,000	100,000
Desyn, ...	...	...	—	—	1,900	1,300	40,000
*Ditto, ...	...	...	4	230	700	1,300	40,000
Deskere, ...	...	...	—	—	1,800	1,400	60,000
*Ditto, ...	...	...	7	44(?)	1,000	1,000	70,000

* Barley and rice.

			No. of Villages.	No. of Barns.	Wheat.	Barley.	Dirhams.
Beráz alrúd, ...	...	...	—	—	3,000	5,100	120,000
*Ditto, ...	...	...	6	26(?)	3,000	2,000	120,000
Bandanjayn, ...	...	...	—	—	600	500	35,000
*Ditto, ...	...	...	5	54	600	500	100,000
*The three Nahrawán, ...	...	...	21	380	—	—	—
Upper Nahrawán, ...	...	...	—	—	1,700	1,300	53,000
*Ditto, ...	...	...	—	—	2,700	1,800	350,000
Middle Nahrawán, ...	...	...	—	—	1,000	500	100,000
*Ditto, ...	...	...	—	—	1,000	500	100,000
Lower Nahrawán, ...	...	...	—	—	1,000	1,200	150,000
Baduráyá and Baksáyá, ...	...	...	—	—	4,700	5,000	33,000
*Ditto ditto, ...	...	...	7	—	4,700	5,000	330,000
Rustuqbád, ...	...	...	—	—	1,000	1,400	246,000
Silsyl and Mahrúd, ...	...	...	—	—	2,000	1,500	150,000
The Kúra (provinces) of the Tigris							
yielded in A.H. 260 (266?),	—	—	—	—	9,000	4,000	430,000
Land-tax of the Kura (provinces)							
of the Tigris, ...	...	...	—	—	—	—	8,500,000

In reference to the Ighár of Yaq̄tyn, mentioned in the preceding list, Qodáma says, no mention was made of it in the days of the Persians, nor was there such an Ighár existing in their times. Yaq̄tyn had claims on the government, and he received as payment lands in various districts, subsequently they lapsed to the government, and they were called Ighár of Yaq̄tyn. The canal of Çilla was dug by order of Mahdiy in the districts of Wásit, and thereby a good deal of waste land was reclaimed. The produce (of the Ighar and of the reclaimed land) was destined for prayers and defraying other expenses in the two holy places (Makka and Madyna). It is said the arrangement was made that two-fifths of the crops were to be given up by the cultivators for this purpose. This settlement was to last fifty years, after the lapse of which a new settlement was to be made.

Ighár (إغار) is correctly explained by Barbier de Meynard, *dict. geogr. de la Perse*, p. 65, "Il s'applique à une ville ou à une propriété qui, moyennant une certaine somme stipulée une fois pour toutes, et payée chaque année directement au souldhan, est exemptée de la visite et du contrôle des percepteurs du fisc." Qodamá defines it

الإيغار هو ان تحمي الضيعة من ان يدخلها احد من العمال و اصحاب بها يامر الامام به من وضع شي عليها يودي في السنة اما في بيت المال او غيره من الابصار

"Ighár (protection against danger) means, that a landed tenure is exempt from the visits of the collectors and from what is connected with them (rapacity and oppression), in consequence of an order of the head of the State which fixes a certain annual quit-rent to be paid either into the public treasury, or into the treasury for the support of a military cantonment." The principal advantage of an Ighár consisted in being free from those harpies, the Omlas.

The provinces of the Tigris which form the last and largest item, may be those which were ceded to the Baḡra government, and they seem to answer to those enumerated by Barbier de Meynard, p. 133, under Nos. V. and VI.

Some of the figures in the preceding table, taken from the very incorrect copy of Qodáma, are certainly erroneous, and may be corrected by comparing them with those of Ibn Khordádbeh. It must, however, be borne in mind that the data reported by the two authors are not in all instances the same. At the time of Ibn Khordádbeh, for instance, the whole of the revenue of the Tigris provinces seems to have been levied in cash, at the time of Qodáma partly in cash and partly in kind. For us the sum total alone is of some interest, and this is given by Qodáma, who says, وذلك ارتفاع السواد سوى اصدقات البصرة من الحنطة و ١١٧٢٠٠ كرو و من الشعير ٩٩٧٢١ كرو و من الورق ٨٠٩٥٨٠٠ درهم يكون عن الغلات باواسط الاسعار وهو حساب الكرين المقربين من الحنطة و الشعير ستين دينارا و هو من العدين ورقا علي صرف خمسة عشر درهما بدينار ١٠٠٣٦١٨٥٠ درهم و مجموع ذلك الي الورق ١٠٨٤٥٧٦٥٠ و كانت صدقة البصرة ترتفع في السنة ٦٠٠٠٠٠٠ فجميع ارتفاع لي ما بين من التسعين على العبر المبنية ١١٨٤٥٧٦٥٠ درهم

"The revenue of the Sawád, exclusive the poor rates of Baḡra, consists of 117,600 Korrs of wheat, 99,721 Korrs of barley, and 8,095,800 Dirhams of silver. The grain at the mean market price, that is to say at the rate of two Korrs, one of wheat and one of barley at 60 Dynárs, taking one Dynár at the present rate of exchange equal to 15 Dirhams, is worth 100,361,850 Dirhams. Adding this sum to the cash payments, there results a total of 108,457,650 Dirhams. The poor rates of Baḡra amount annually to six million Dirhams, the

average revenue is therefore (some words unintelligible) 114,457,650 Dirhams."

These data enable us to calculate the price of grain at the time of Qodáma. We convert the 100,361,850 Dirhams into Dynárs, by dividing the number by 15, and we obtain 6,690,790 Dynárs. With this money we purchase all the barley, and as many Korrs of wheat as there are Korrs of barley. Our expenditure amounts to $99,721 \times 60 = 5,983,260$ Dynárs to spend and 17,879 Korrs of wheat to buy. If we divide the former number by the latter, we find that the Korr of wheat costs $19\frac{1}{2}$ (*i. e.* 39 Dynárs and 10 Kiráts), and consequently the Korr of barley $20\frac{1}{2}$ Dynárs. The result cannot be far from the truth; for at the time of Mohammad wheat was at Madyna twice as dear as barley (comp. my *Leben des Moh.*, Vol. 3, p. 140), and consequently, if one Korr of wheat and one Korr of barley together cost 60 Dynárs, the price of wheat ought to be 40 and that of barley 20 Dynárs. But there remains much too great a cost in the division than that Qodáma should have neglected it. I therefore propose to read 117,691 Korrs of wheat instead of 117,600. If we adopt this reading, a Korr of wheat cost 39 Dynárs and $7\frac{1}{2}$ Kiráts ($20 \text{ Kiráts} = 1 \text{ Dynár}$) and a Korr of barley 20 Dynárs $12\frac{1}{2}$ Kiráts. A pound of bread (English weight) may have cost about 3 farthings.

In Qodáma occurs the following passage regarding the assessment of 'Omar I. قال القاسم بن سلام ان عمر بن الخطاب بعث عثمان بن حنيف الانصاري فمسح السواد فوجدته ستة و ثلثين الف الف جريب فوضع على كل جريب عامر وغامر يبلغه الماء قفيزا و درهما قال القاسم و بلغني ان ذلك القفيز كان مكوكا لهم يدعي الشايرقاني وقال يحيى بن ادم هو المختوم الحجاجي

Qásim b. Sallám asserts that 'Omar, the son of Khattab, sent 'Othmán b. Honayf of Madyna, and that this 'Othmán measured the Sawád, and found that it contained 36 (*sic*) millions Jarybs, and he imposed upon every Jaryb of land, cultivated or fallow, provided it could be irrigated, a tax of one Qafyz and one Dirham. Qásim says, I have heard that this Qafyz was a cubic measure then in use in the Sawád, and that it was called Shabirqány. Yafya b. Adam says it is identical with the Makhtúm of Hajjáj.

This account differs from that of other authors, who record that 'Omar I. assessed the Sawád as follows:—

Every Jaryb of Barley,	2 Dirhams.
„ „ „ Wheat,	4 „
„ „ „ Vineyards and orchards,	6 „
„ „ „ Date plantations,	8 „

The assessment of Omar was according to a tradition of Jábir by himself called *Tasq* طشق Freytag considers this term cognate with the expression of the Arabic Christians *Taq* طقس, and it is perhaps also related with *qist*. No doubt it is derived from the same Greek word from which our tax comes. I believe, but am not sure, it was a *permanent* settlement, though owing to the disposition of the rulers and to circumstances, changes have taken place. The term *tasq* is applicable only to taxes levied from conquered land.

It is pretty certain that the land-tax amounted to about one-half of the value of the produce. Qodáma speaks of the tithes, and then he continues *واما الطسوق فانما وضعت علي حسب المقاسمات فوضع طسق الاستان علي حسب ما يكون مشاكلا للمنافقة والدليل علي ذلك انه متي احتيج الي تعشير ارض اخذ من طسق الاستان الخمس لان خمس النصف عشرا لاصل* The taxes on conquered land have been fixed in accordance to the annual produce (of several years); consequently the tax of a district has been fixed agreeably to justice. In proof thereof we may mention that in case it be necessary to convert *tasq*-land into tithe-land, one-fifth of the original *tasq* of the district is taken, because $\frac{x}{4} : 5 = \frac{x}{10}$ (x , in the original *الاصل* means in this case the value of the produce.)

I. believe we may safely infer from this passage that in the assessment of conquered lands, the same rules prevailed, as in fixing the amount of tithe, with the only difference that one-half instead of one-tenth was levied. The general rule was that land which was watered without the expense of labour, paid the whole tithe.

If labour was expended, one-half of the tithe or more was taken. Thus, if land was watered twice by a canal running through it, or if it was three times irrigated by means of a bucket by which water is raised from a canal, the tithe amounted not to ten, but to seven per cent., viz. 4 per cent. for the canal and 3 per cent. for the bucket.

The 'Abbásides changed the system of revenue in the Sawád. Qodáma says: Abú 'Obayd Allah Mo'áwiyya b 'Abd Allah, the

secretary (Kátib) of the Khalyf Mahdiy reported on the inconveniences which arose, if the *tasq*-payers were obliged to pay a fixed sum of money, or to supply a certain quantity of grain, and he proposed that the taxes should be calculated (annually) by the Jaryb, as there was no telling whether the prices would sink or rise. In the one case the cultivator, in the other the government were in the disadvantage. The best thing, he thought, would be to introduce the same rule which the prophet adopted with regard to Khanghar: he left to the inhabitants the land under the condition that they were to give up to him one-half of the produce (as much the cultivators ought to give up from irrigated land); but if the labour of irrigation was very hard, they ought to give up only one-fourth; and if it was less hard, one-third. The choice was to be left to the farmers to give up as much straw* to government as was due to it (*i. e.* $\frac{1}{2}$ or $\frac{1}{3}$ or $\frac{1}{4}$ according to circumstances), or to sell it and pay the tax according to the market price of grain. In fixing the amount of revenue on vineyards, trees of every description, vegetables and every kind of produce, agreeably to the dictates of justice, the nett price which would be realized by the sale was to be calculated, taking into consideration what distance the land was from the market or harbour, and how great the expense and loss of time would be for bringing it there. After all these deductions one-half was to be charged as revenue.

This system of revenue, which was eventually introduced, and by which the above detailed statements of Ibn Khordádbeh and Qodáma are to be explained, is called *Moqásima*, a term which is used up to this day in India very nearly in the same signification as it was used at the time of our author: "partition of the actual crop between the cultivator and the State, either in kind or in value."

Certain it is that one-half of the produce was taken from the cultivators by the 'Abbásides; but it is not certain whether 'Omar made so high a settlement as to deprive the farmers of the value of one-half, and whether the above passage of Qodáma is applicable to the time previous to the Abbáside dynasty. But we may safely assume that even at the time of 'Omar I. the revenue amounted to two-fifths. Now if a Jaryb of wheat paid 4 Dirhams to Government, the value of the whole produce of a Jaryb could not be more than

* In the original تبن

10 Dirhams. This does not square either with the prices of grain in those days, nor with the size of the Jaryb which I have found. There must be something wrong in my calculations, and I therefore would call the attention of men in India, who take an interest in such matters, to the subject. They have means of ascertaining facts connected with revenue and agriculture, which are wanting in Europe.

I now insert a statement of the revenue of the other provinces of the empire of the Khalyfs, according to Qodáma.* He usually gives the numbers and names of the districts into which every province was divided for the sake of administration, and states the totals of the revenue. As the MS. is very incorrect, I omit the names of districts and confine myself to the provinces :

	Dirhams.
Ahwáz,	18,000,000
Fáris,	24,000,000
Kermán,	6,000,000
Mekrán, the Moqátea amounted,	1,000,000
Ispahán,	10,500,000
Sijistan, the Irtifá' revenue, according to agreement, amounted to, ...	1,000,000
	<hr/>
	60,500,000
	<hr/>

Khorásán. If I understand right, this immense province was leased to Abd Allah b. Tâhir, that is to say, he received the whole revenue, defrayed the expenses of administration, and kept the surplus after having sent the tax to the treasury of the Khalyf in cash including the value of a certain number of horses and slaves furnished to him,	38,000,000
Máh-Kúfa, <i>i. e.</i> Daynawar,	1,000,000
Máh-Bacra, <i>i. e.</i> Nohawand,	800,000
Hamadán, ...	1,700,000
Masibzán,	1,100,000
Mahrján-Qazaq,	1,200,000
Qomm and Qóshán,	3,000,000

* Which may be compared with that of Ibn Khordádbeh.

Azerbyjan, Ardebyl, Marand, &c.,	4,500,000
Rayy,	20,000,000
Qazwyn in A. H. 237,	2,628,000
Qúmis,	1,105,000
Jorján,	4,000,000
Táberistán and Ámol in A. H. 234,	200,163,070 (?)
Tikryt, Sonn and Bawázij (on the Tigris),	700,000
Mosúl pays into the treasury of the Khalyf, ...	2,750,000
But the revenue of Mosul amounts to,	6,800,000
Jazyra Ibn 'Omar (close by Mosul),	4,635,000
Arzen,	4,100,000
Tarún in Armenia, the Moqáte'a amounts to, ..	100,000
Armenia, the Irtifá' revenue amounts to,	400,000
Diyár Momíur (northern Mesopotamia),	6,000,000
Taryq Forát (west bank of Euphrates),	2,700,000
	<hr/>
	17,935,000
	<hr/>

	Dynárs.
Aleppo and Qínnesryn,	360,000
Homs,	118,000
Damascus,	110,000
Jordan,	195,000
Egypt and the coast of the Mediterranean as far as Barqa,	2,500,000
Haramayn, i. e. Northern Arabia,	100,000
Southern Arabia (Yaman),	600,000
Bahrayn in A. H. 237,	510,000
'Omán,	300,000

The author concludes : " These are the provinces, as we have enumerated them, and this is the amount of revenue which they yield. We stated the average ; sometimes it is in some places larger, sometimes less. We pay no attention to these fluctuations, they are due to the want of good administration. The reader will find that the whole revenue which we have enumerated amounts to about 4,920,000 Dynárs, which make, at the present rate of exchange, the Dynár at 15 Dirhams, 73,800,000 Dirhams."

This sum represents 68,347 Roman pounds of gold, and does not amount to much more than two millions sterling, but this is only the revenue of the western provinces where the Dynár was the currency. It is true, if we cast up the above items, we obtain a sum which falls short by 127,000 Dynárs of the sum stated by Qodáma. This, however, is evidently owing to an omission or a mistake in the text.

If we omit in the item Tabaristan, the two hundred millions as being evidently too large, the revenue of the eastern provinces including the Sawád amounts to 223,487,320 Dirhams, or 2,171,404 Roman pounds of pure silver, or about 162 millions of francs. The income of the whole empire, as it was at the time of Qodáma, did not therefore amount quite to $8\frac{1}{2}$ million pounds sterling. But we must recollect that a great proportion of it was the nett income, after all expenses of administration had been defrayed, and may be considered as the civil list of the Khalyf.

The study of the finances of the glorious Khalyfs would be edifying for discontented Musulmans in India. The Khalyfs, like Indian princes, squandered away the money in debauchery, ground down the people to the dust, surrounded themselves with Tartar mercenaries, who soon became a pretorian guard, full of insolence and insubordination. These deposed or put to death the Khalyf at pleasure, and no longer content with putting on the screw as tightly as possible, they plundered the provinces; and now those countries are so completely depopulated, that many a district, which at the time of Qodáma yielded a revenue of more than a million of Dirhams, cannot pay as many cowries.

There is much good in the Islám and in the Musulmans, but they have a great deal to learn, before they will be able to administer their own affairs.

LITERARY INTELLIGENCE.

The learned Professor Mahes'achandra Nyáyaratna, of the Calcutta Sanskrit College, has just brought out a new edition of the *Kávyá Prakás'a*, a treatise on Sanskrit Rhetoric by Mammaṭa Bhaṭṭa. It is illustrated by a number of explanatory notes by the editor, and has an excellent introductory essay. The last is a new feature in a Sanskrit book edited by a modern Pundit. It gives a summary of the principal works on Rhetoric in Sanskrit, their ages and characteristics, the relation which the work of Mammaṭa Bhaṭṭa bears to them, the number of manuscripts used in printing it, its contents and age, and a variety of other interesting literary and critical notices.

The Professors of the Benares Sanskrit College have started a monthly journal devoted to Sanskrit Literature. It is named THE PUNDIT, and is intended to serve as a vehicle for the "publication of rare Sanskrit works which appear worthy of careful editing hereafter; to offer a field for the discussion of controverted points in old Indian Philosophy, Philology, History and Literature; to communicate ideas between the Arian scholars of the East and the West; between the Pundits of Benares and Calcutta and the Sanskritists of the Universities of Europe." The first three numbers, already published, contain, among other articles, two cantos of the second half of the *Kumára Sambhava*, short notices of topics on Indian Astronomy and Logic, and a reprint of the late Dr. Ballantyne's essay on the Nyáya.

Pundit Rangáchári Swámí, of Brindábun, has published, for gratuitous distribution, a Sanskrit pamphlet entitled *Durjana-kari-pañchánana*. Its object is to prove the authenticity of the present form of Vaishṇava worship, and to refute the opinion of the court pundits of Jaipur, who maintain that there is no ordinance in the shasters to justify the worship of Govindají, the great idol of that place, and accordingly recommend that it should be cast out of its temple. The author, in his little book, displays consummate polemical powers, and a thorough knowledge of the literature of the Vaishṇavas.

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PART I.—HISTORY, LITERATURE, &c.

No. III.—1866.

*A notice of the Çaunaka Smṛiti. By Professor GEORGE BÜHLER,
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[Received 26th Sept., 1865.]

There is a passage in the introduction to Shadguruçishya's commentary on the Sarvānukramaṇi,* which professes to give an account of the life and works of the ancient sage and writer on the Rig Veda, Çaunaka. It is stated there that Kātyāyana, who compiled the Sarvānukramaṇi, or "general index to the Rig Veda" from the separate indexes made by Çaunaka, knew and studied ten works ascribed to this author. The last, in the list given there, is "the Smārta" or work on matters relating to traditional laws on ceremonies. In the Mānavadharmasāstra (III. 16) Çaunaka is also mentioned as a writer on law, and in modern works, such as the Dattakamīmāṃsā, Dattaka-chandrikā, Nirṇayasindhu, Samskārakaustubha, Vyavahāramayūkha, we find a number of ślokas attributed to this Rishi. A considerable portion of these verses treats of the law of adoption, and this circumstance induced me, when my attention lately was directed to the Hindu law, to make a search for the Çaunaka-smṛiti. By the recovery of this work I hoped to be enabled to decide a rather difficult question regarding the unconditional right of Hindu widows to adopt a son, which arises out of a reading, given by one of the modern law-books. Besides, as I believed with Professor Stenzler,† that the Çaunaka-smṛiti treated exclusively of adoption, I expected to gain

* M. Müller, Hist. Sk. Lit. p. 233l.

† See Weber Ind. Stud. Vol. I. p.

fuller information regarding this difficult and interesting chapter of the Hindu law. My endeavours were successful, and I obtained two books, the one of which is known amongst our çástris as the *Bṛihat*—or great—the other as the *Laghu*—or small, *Çaunaka-smṛiti*. The larger of these two works, which contains about 2,500 *çlokas*, is, however, in my MS. called the *Çaunakíyá-káriká*, or “memorial verses of *Çaunaka*.” The smaller, which consists of about 300 *çlokas*, is called *Yajnángadharmaçástram*, “or the *Dharmaçástra* connected with the sacrifice.”*

The former of the two, the *Çaunakíyá-káriká*, proves to be the work, which Nanda Paṇḍita the author of the *Dattakamímámsá*, and other writers on adoption, quote, and it appears, that not the whole of it refers to adoption, but only a small part, which has been given in the *Mayúkha* and in the *Samskárakaustubha* in its entirety. Though my hope to obtain fresh information regarding the law of adoption has therefore proved to be vain, I nevertheless venture to publish this notice of the work, as it assists to decide the question alluded to before, and as from a historical point of view some interest attaches to every work that bears the name of *Çaunaka*. My copy is a transcript of a MS. written in the end of the last century (*Çáka*, 1711, A. D. 1790), and, by no means free from faults. But it will enable me to give an idea of the nature of the work.

The MS. opens with three verses which cannot belong to *Çaunaka*, but seems to have been added by some later hand.

They run as follows :—

Jayanti jagadátmánas tamah samxaya bhásharáh
Rámánuja padávápta bhúshanáh purushottamáh
Çrutismṛiti-jalápúrṇam çástra-kallola-samkulam
Vishṇubhakti-mahá-potam vande ham çaunakárnavam
Tatsatram çaunako drishṭvá svayam harsha samanvitah
Vyápáṭhayatsvaham çishyam tam namámyáçvaláyanam.

1. “Those best of men conquer, who are the souls of the world, the suns for the destruction of darkness, who are adorned (by the faith taught) by the feet of *Rámánuja*.”

2. I worship *Çaunaka*, who is comparable to an ocean, whose

* In my copy the beginning is wanting. The book treats of sacrificial rites and seems to be of no importance for the Hindu law.

waters are the Çṛuti (Vedas) and Smṛitis, whose waves are the Institutes of science, and which is traversed by the great ship of the faith in Viṣṇu.

3. I bow to Ācvalāyana, his pupil, whom Çaunaka himself taught joyfully, after having seen that great sacrifice (in the Nimisha forest.)”

After this exordium, which evidently has been composed by a follower of Rāmānuja, begins the work itself. It consists of :—

1. Paribhāśās.
2. Sthālīpākavidhi.
3. Mútrapurīshotsargavidhi.
4. Sandhyopāsanāvidhi.
5. Kāmyajapavidhi.
6. Dhanārjanavidhi.
7. Snānavidhi.
8. Brahmajajnavidhi.
9. Devapújāvidhi.
10. Vaiçvadevavidhi.
11. Kautukabandhanavidhi.
12. Ankurārpanavidhi.
13. Rituçántividhi.
14. Garbhālabhanavidhi.
15. Pumsavanānavalobhane.
16. Símantonnayanavidhi.
17. Yátakarmavidhi.
18. Nāmakaraṇavidhi.
19. Nishkramaṇavidhi.
20. Annapráçanavidhi.
21. Caulakarmavidhi.
22. Upanayanavidhi.
23. Bhikshāvidhi.
24. Anupravacānīyavidhi.
25. Medhājananavidhi.
26. Upākarmavidhi.
27. Utsarjanavidhi.
28. Mahāvratavidhi.
29. Upanishadvratavidhi.

30. Godānavidhi.
31. Samāvartana-vidhi.
32. Kanyābhyantaravidhi.
33. Vivāhalakṣhaṇavidhi.
34. Vadhūgṛihagamanavidhi.
35. Madhuparkavidhi.
36. Kanyādānavidhi.
37. Vivāhavidhi.
38. Gṛihapraveṣanīyavidhi.
39. Stambhabalividhi.
40. Abdapratishṭhāvidhi.
41. Udyānapratishṭhāvidhi.
42. Aṣvatthasthāpanavidhi.
43. Grāmapratishṭhāvidhi.
44. Atipatrahomavidhi.
45. Punahsamdhānavidhi.
46. Nāstikyādiviśiṣṭāgnih punah samdhānam.
47. Dvibhāryāgnisamsaryavidhi.
48. Arkavivāha.
49. Putrakāmesṭhi.
50. Putraparigraha-vidhi.
51. Samāropaṇavidhi.
52. Pārvaṇasthālīpāka.
53. Prati sthālīpākavidhi.
54. Āraṇyākarmavidhi.
55. Sarpabalih.
56. Aṣvayujīkarmavidhi.
57. Āgrāyaṇavidhi.
58. Abhisheka-vidhi.
59. Grahaṇābhisheka-vidhi.
60. Samkrāntābhisheka-vidhi.
61. Rājābhisheka-vidhi.
62. Paṭṭābhisheka-vidhi.
63. Apamṛityuhomah.
64. Āyushyahomavidhi.
65. Bṛihaspatiṇānti.
66. Ādityaṇānti.

67. Adbhutaçánti.
68. Svapnotpátavidhi.
69. Vidyudagnividhi.
70. Valmikaçánti.
71. Gojaçánti.
72. Gojavagaçánti.
73. Açvataréçánti.
74. Yaxmaçánti.
75. Saxvarogaçánti.
76. Kṛityaçánti.
77. Çatruçánti.
78. Abhicáraçánti.
79. Jívaçráddha.
80. Garbhinyudakasthádi samskáravidhi.
81. Múlaçánti.
82. Açleshaçánti.
83. Vaidhṛiti vyatípáta samkrántividhi.
84. Grahaṇasútividhi.
85. Abdapúrtividhi.
86. Yatisamskáravidhi.
87. Ahitágnerdeçántaramaraṇavidhi.
88. Brahmaçárimaraṇavidhi.
89. Sarpasamskáravidhi.
90. Abhyúdayaçráddhavidhi.
91. Kámyádiçráddha.
92. Piṇḍapitriyajnavidhi.
93. Párvanaçráddhavidhi.
94. Saptamíçráddha.
95. Ashtamíçráddha.
96. Anvashtakíçráddha.
97. Naxatrahomaçánti.
98. Nárāyaṇabali.

From this summary it will appear, that the work is more extensive than a Grihyasútra. It contains more matter than the latter class of works usually do, especially the çántis or "propitiatory rites" are peculiar to it. Besides, its descriptions of the various ceremonies are fuller and more detailed than those in the Sútras. They resemble

most those of the modern Prayogas or "Manuals." On the other hand the work is not like a Dharmasūtra or Dharmashāstra, as it gives less the duties of a Hindu than a description of the various rites to be performed by him.

The first question which now obtrudes itself, is, whether this curious work is really a composition of the ancient sage Çaunaka or a production of later times. The fact, that so very frequently a new topic is introduced with the words "I, Çaunaka, will declare" (Çaunakoham pravaxyāmi) and similar phrases, would seem to furnish proof that the Kārikā is the original work of Çaunaka.

Besides there is some circumstantial evidence which makes in favour of this opinion. Firstly, nearly all the Mantras quoted are taken from the R̥g Veda and show that the author was a follower of this Veda. As it is well known that Çaunaka belonged to the Bahvṛicas, this fact is of some importance. Secondly, many passages of the Kārikā agree almost literally with the Sūtras of Ācvalāyana, and these two works agree very closely in regard to some ceremonies which are unknown to the other Vedic schools. As, according to tradition, Ācvalāyana was a pupil and follower of Çaunaka, these points also speak for the authenticity of the Kārikā.

The rules regarding the Garbhālabhāna and the Anavalabhāna, two ceremonies to which are to be performed soon after marriage, furnish an instance of the close resemblance of the two works. Ācvalāyana says Gṛihyasūtra I. 13.1. upanishad ; garbhalambhanam pumsavanam anavalabhanam ca. I. 13.2 : yad ? nādhiyāt.

1. In the Upanishad are (prescribed) the Garbhalambhāna, Pumsavana, and Anavalabhāna.

2. If he does not study it (he shall perform the following rite).

Çaunaka gives the following rules on this subject :—

Garbhalambhaḥ pumsavanam garbhasyānavalobhanam. Iti karmatravyamidam yajnopanishadēritam.

Tāmadhītavataḥ karma trayam tathaiṣa sugrahaḥ.

Anadhīta vā tas tvesha pra yogotra nibadhyate.

"The Garbhalambha, the Pumsavana and the Garbhānavalobhāna, these three ceremonies are enjoined in the Yajnopanishad. These three ceremonies, which are easily understood, (ought to be performed)

by him who has studied that (Upanishad). But for him who has not studied it, the following rite is ordained." The similarity of these passages has so much more weight, as Āçvaláyana and Çaunaka are the only writers on Grihya ceremonies known, who mention the two ceremonies. Another case in which the Káriká and the Grihyaçútra fully agree is the order of the forms of marriage. In Āçvaláyana's enumeration the Paicáca form stands last but one, and the Ráxasa form last. The Káriká gives the same order, whilst Manu, Yájñaval-
kya and Vishnu make the Paicáca form follow the Ráxasa. It would be easy to multiply these instances of resemblance between the two works.

But though the work announces itself as proceeding from Çaunaka, and though there is apparently some circumstantial evidence supporting this claim, there are also some points which make it highly improbable that Çaunaka is its immediate author.

Firstly, the Káriká advocates the Vaishṇava faith. Vishnu is repeatedly called the *devadeva*, the "god of gods," the worship of the Tulasí plant is frequently enjoined, and peculiar rites and symbols of the Vishṇuítés, such as the náraca, the padmáxa and tulasímaṇi, the cakramudrá are occasionally mentioned. Though the worship of Vishnu may possibly be very old in India, nevertheless it is hardly probable that the adoration of the Tulasí should be derived from the times of Çaunaka, who certainly lived before Páṇini. Anandagiri, the disciple of Çankarácárya, is, as far as I know, the first writer who testifies, that in his times divine honours were paid to this plant.

This circumstance prevents me from considering Çaunaka as the immediate author of the Káriká. But as the work so ostentatiously uses the name of Çaunaka, and certainly teaches on the whole the ritual of the Ríg Veda, and moreover shows in many points a close affinity with the Āçvaláyanaśaútras, I am inclined to consider it as a redaction of the old Çaunaka-smṛití by a Vaishṇava. Some other points confirm this opinion.

Firstly, the title Çaunakíyákáriká itself suggests the idea of a verified redaction of an older work. The word Káriká is used to designate "memorial verses," such as the verses attached to Páṇini's grammar, and a class of works on scientific subjects composed in the Anushtubh metre. Thus we have a Sámkhyakáriká, Mandúkopanishat-

káriká, an Aṣváláyanagrihya-káriká, Çáñkháyana-káriká. But the Sámkhyá kárika is confessedly later than the Sámkhyasútras, the Aṣváláyana-káriká is said to be composed by Kumárilabhaṭṭa, the Mandúkopanishad-káriká of course claims not the authority of the Upanishad itself.

It is therefore to be expected that the Çaunakíyá-káriká likewise is merely based on a Çaunaka-smṛiti.

The second circumstance, which is in favour of our theory, is that sectarians in general, and the Vaishṇavas in particular, have also in other cases both worked up older Smṛitis into new forms and interpolated them with additions of their own, and even composed some new ones under old names. I hope soon to give this question a fuller consideration, and content myself with mentioning here two cases. The one is that of the Vishṇu-smṛiti, which seems to be a Vaishṇava redaction of an older Sútra, and the second that of the Bṛihaddháríta-smṛiti, which is a modern work, teaching exclusively the Vaishṇava rites and doctrines.

It is of course impossible to say which parts of the Káriká are new, and which old. But, in favour of the older work, we can at least make a tolerably safe conjecture. I have remarked already that the Káriká does not resemble exactly either a Dharmasútra or a Grihyasútra. We find also a number of quotations from Çaunaka in the Mítákshará, Madanapárijáta, and Paráçara-mádhava, which evidently are taken from his Grihyasútra, but to which nothing in the Káriká responds. The fact is, that our Káriká most probably is a versification of a number of Paríçishtas belonging to the Çaunaka-grihyasútra. Several collections of Paríçishtas treating of Grihyá ceremonies are in existence. One of them belongs to the Sâma Veda, and includes a mahánámnívratavidhi, a upanishadavratavidhi, a snánavidhi etc. Another such collection is tacked to the Baudháyana grihyasútras. It closely resembles that contained in the Çaunakíyá káriká. It begins, just as this, with Paribhášás and contains more than a hundred divisions, which treat of nearly the same subjects, as Çaunaka's work, *i. e.* Samskára, Çánti and Çráddha. The language is mostly prose, only a few divisions are in verse. Each part begins with the words "atháto vidhimvyákhyásyámah. "Now then we shall explain the rule for, " and generally ends

with "Atháha bhagaván baudháyanaḥ, thus says the venerable Baudháyana," or a similar phrase. Amongst other interesting matters we find in it also the 'rule of adoption' quoted by Nandapaṇḍita in the Dattakamímámsá. I shall give it below, and it will serve to show how great the resemblance is between the two works. What purpose these Pariçishtaḥ served, and whether they belong to the same authors as the corresponding Sūtras, are questions which are open to discussion. But the circumstance that Baudháyana's 'vidhis,' as well as those belonging to the Sāma veda, are chiefly in prose, strengthens the supposition that the Çaunakīyá káriká has been remodelled and verified by some later writer. It is not at all improbable that this Vaishṇava author, and the follower of Rámánuja who composed the introductory verses, are the same person, and that the work in its present shape is not older than the thirteenth or fourteenth century; for the Mítákshará and its immediate predecessor never quote this work. In the chapter on adoption it is not mentioned at all, and Viçveçvara as well as Vijnáneçvara elsewhere quote a Çaunaka in prose. On the other hand Devandabhaṭṭa and Nandapaṇḍita, who are both Southerners and countrymen of Rámánuja, quote it.

I now proceed to give the text and translation of the Putrasamgrahavidhi, according to my MS. compared with the Dattakamímámsá of Nandapaṇḍita, the Dattakacandriká, the Vyavahára-mayúkha and the Samskárakaustubha. There appear to have existed two redactions, one followed by the Dattakamímámsá and the Dattakacandriká, the other by the MS. and the other books mentioned. I cannot believe that this circumstance is accidental, especially as it repeats itself in the use of the Baudháyana-pariçishta, where the Samskárakaustubha and my MS. are likewise opposed to the Dattakamímámsá and Dattakacandriká. Devandabhaṭṭa and Nandapaṇḍita are both Southerners, and the authors of the Mayúkha and of the Samskárakaustubha, as well as the possessors of the originals from which my copies are taken, are all Maháráshṭradeshaḥastha Brahmans, it would therefore seem that both in the case of the Çaunaka-káriká and that of the Baudháyana, there existed, two redactions, a Maháráshṭra and a Southern.

I give here the text of the former, as it is the shorter one, and the additions of the latter in the notes.

1. Çaunakoham pravaxyámi putrasamgrahamuttamam.
Aputro mṛitaputro vá* putrārtham samuposhya ca.†
2. Vāsasí kuṇḍale dattvá ushñíṣham‡ cángulíyakam.
Ácáryam dharmasamyuktam vaishpavam vedapáragam.
3. Barhih kuçamayam caiva pálācam cedhmameva ca.
Etányáhritya§ bandhúmçca jñátínáhuya yatnatah.||
4. Bandhúnannena sampûjya¶ bráhmaṇámçca viçeshatah.
Agnýádhánádi* yat tantram kṛitvájyotpavanántakam.†
5. Dátuh samaxam gatvá tu putram dehíti yácayet.‡
Dáne samartho dátásmai ye§ yajne neti pancabhih.
6. Devasya tveti mantrena hastábhyám parigrihya ca.
Angádangetyricam japtvá cághráya|| cicumúrdhani.
7. Vastrádibhíralamkṛitya putracháyávaham¶ sutam.
Nṛityagítaicça vádyaicça svastiçabdaicça samyutam.*

* Datt. mím. page 1, line 6, Calcutta edition, bandhyo mṛitaprajo vápíti páth-ántaram. But ibid. page 32, line 1, this reading is attributed to Vṛiddhagautama. The sense remains the same, only the use of the word bandhya is remarkable.

Samsk. kaust. fol. 47, page 1, line 3, Bombay lith. ed. 1 : bandhyá mṛitaputrá vápí ; i. e. "a woman who is barren or whose children have died." This reading, if correct, would authorise women to adopt without having obtained the permission of their husbands or relations. But it is wrong, because in v. 13 and 14, the adopting person is spoken of in the masculine, and because Vedic rite cannot be destined in the first instance for women. Perhaps the reading was intentionally altered from that given in the Datt. mím.

† S'aun. kár. svakulasya ca "and for the sake of his family," gives no good sense.

‡ S'aun. kár. "coshñíṣham." It seems to be a correction in order to avoid the hiatus which, however, is of common occurrence in the Anushtubh of the Dharmasástras. S'aun. kár. "chattram, an umbrella," for dattvá. The whole then depends on áhritya.

Datt. mím and Datt. chand. add after this one half çloka : madhuparkena sampûjya rájánam ca dviján çucín, i. e. "having honoured* the king (or lord of the village) and pure Brahmins with the Madhuparka," according to the Datt. chand. p. 65, l. 7 Calcutta edition, the verse also occurs in the Vṛiddhagautamasmṛiti. If inserted here, it disturbs the construction.

§ Etányáhritya. Datt. mím., Datt. chand. and Vyav. May. The neuter is the form required by the grammar.

|| Sattamah, Vyav. May.

¶ Annena sambhajya ; Datt. mím, Datt. chand. Vyav. May.

* Anvádhanádi yat ; Vyav. May.

Agnýádhánikam tatra Datt. mím. Datt. chand. Anvádhana means a kindling of the fire preceded by a statement of the objects of the ceremony (samkalpa).

† Otpavanádikam S'aun. kár., Vyav. May. Datt. mím.

‡ Vácayet ; S'aun. kár.

§ Dátásau ; S'aun. kár., dátásmi Vyav. May.

|| Aghráya ; Datt. mím. Datt. chand.

¶ Chatracháyágatam ; Samsk. Kaust., i. e. walking under the umbrella.

* Samyutah ; Samsk. Kaust.

8. Grihamadhye* tamádáya carum hutvá vídhánatah.
Yastvá hṛidetyṛicácaiva tubhyam agra ṛicaikayá.†
9. Somo dadadityetábhih pratyṛicam pancabhistathá.
Svishṭakridádihomam ca kṛítvá‡ çesham samápayet.
10. Bráhmaṇánám sapindeshu kartavyah putrasamgrahah.
Tadalábhesapindeshu§ anyatra tu na kárayet.
11. Xatriyánám svajátan vá gurugotre samepi vá.||
Vaíçyanám vaíçyajáteshu¶ cúdránám cúdrajátishu.
12. Sarveshám caiva varṇánam játishveva na cányatah.
Dauhitram bháGINEYAM vá cúdránám cápi dápayet.*
13. Naikaputrena kartavyam putradánam kadácana.
Bahuputrena kartavyam putradánam prayatnatah.
14. Daxinám gurave dadyád-yatháçakti† dvijottamah.
Nripo‡ ráshtṛárdhamevápish vaíçyo vittaçatatrayam.||
15. Çúdrah sarvasvamevápí açaktaçced yathábalam.
Iti çaunakakárikáyám putraparigrahavidhih.

1. I, Çaunaka, will declare the most excellent (rule) for adopting a son. A person who has no son, or whose son has died, should fast (on the day preceding the ceremony) for the sake of a son.

2. (He then should) place (in readiness¶) two garments (upper

* Adhyetamádháya; Datt. mím., Datt. chanda—grīhametyedhnamádáya, i. e. having returned home and placed fuel on the fire; S'aun. kár.

† Yatváhṛidetyṛicenaiva. Datt. mím. yastváhṛitetyṛicácaiva. Datt. chand. yastváhṛidetidvábhyám tu. Samsh. Kaust.

‡ Hutvá; Vyav. May.—çesham ca kṛítvá homam samápayet. Samsk. Kaust.

§ Asapindo vá, Vyav. May. Datt. mím.

|| Gurugotrasamopi vá; Vyav. May. gurugotrasamepi vá. Samsk. Kaust.

¶ S'údrajátishu S'aun. káriká and Vyav. May. against the metre.

* Caryadi; S'aun. kár. The reading in itself is senseless; but seems to point back to cápi dápayet. The reading given in the text is made up from this and the Samsk. Kaust. "S'údránámapi dápayet." The readings of the other works differ very much from ours:—

Dauhitro bháGINEYACCA	{ cúdrasyá,
	{ cúdraistu,
Pi ca díyate	} Vyav. May.
Kriyate sutah	} Datt. mím. Datt. chand.

After this verse, Datt. mím. page 19, line 12, insert half a S'loka: bráhma-nádi traye násti bháGINE—yah sutah kvacit, i. e. amongst the three castes beginning with the Bráhmaṇa, a sister's son is nowhere adopted. The half verse is quite superfluous.

† Dattvá. S'an. kár., Vyav. May.

‡ Nripa; Datt. mím.

§ Evátha; Datt. mím. Datt. chand.

|| Ratnaçatatadvayam; Samsk. Kaust.

¶ Borradaile translates according to the prayoga given in the Mayúkha: having given two pieces of cloth.....to a priest..... But the verb dá does

and lower) a pair of earrings, a turban and a finger-ring, procure a virtuous priest of the Vaishṇava faith, who has studied the Vedas to their end,

3. A layer of Kuça grass* (to place the Ājyasthālī upon) and fuel of Pālāça wood, and pressingly invite his Bandhu (cognates) and his Sapinda relations (gentiles).

4. Having (next) honoured his relations by (placing) food (before them) and especially the Brahmans, he should perform the ceremonies beginning with the kindling of the sacred fire, and ending with the purification of the liquid butter.†

5. He (then) should go to the person who is going to give away (the boy) and order (the Acārya) to ask him, saying: "Give the child."

6. The person who gives (the child to be adopted, then says): I have authority to give (him the boy, and recites) the five (verses‡ beginning with :) "Who by the sacrifice."

7. (The adopter) should (then) receive the (boy) (drawing him into his legs) with his hands (reciting) the Mantra: "In the creation of Sāvitrī, &c." and mutter the verse: "From the several limbs, &c." and touch with his nose the child's head.§

8. He (then) should adorn the child which (now) resembles a son of the receiver's body, with the dresses and other (ornaments mentioned before).

9. Afterwards (he should) go to his (own) house accompanied by the (boy) with dancing, songs, and sounds of music and blessings,

not take the accusative of the thing given and of the person. The latter ought to stand in the dative, genitive, or locative. Besides, as I am informed, it is not the custom to give such presents to the Achārya at the beginning of the ceremony. The above translation is confirmed by the corresponding passage of Baudhāyana. I take the literal meaning of dattvá here to be "tyúyam kṛitvá."

* Borradaile: "a bunch of sixty-four stems entirely of Kuça grass." I am informed, that so much Kuça grass is usually taken as can be held by joining the tip of the fore-finger to the tip of the thumb.

† A blade of Kuça grass (paritram) is placed lengthwise into the Ājyasthālī, and moved first horizontally and then upwards in order to take away insects, &c., that may have fallen into the ghee. This operation is repeated three times. (Oral information.)

‡ Ríg. Veda. ix. 62, 1—5.

§ Aghrá is usually wrongly translated by 'kissing.' Regarding the correct meaning of the term and the origin of the custom, see my notice in Benfey's *Orient und Occident*.

and offer a burnt offering (of dressed rice) according to the rule, (reciting the verses, "I who within my heart, &c." and "To thee at first, &c.," and the five (verses), "Soma gave her, &c.," (presenting an oblation*) with every verse. Having then performed the Srishtakṛid, and the other offerings, he should finish the remainder (of the ceremony,) *i. e.* Ācīrvāda, dakṣhiṇādāna, &c.

10. Brahmans should adopt amongst their Sapinḍa relations, and if (a Sapinḍa) be not obtainable, amongst those (Brahmans) who are not Sapinḍas; but amongst others (persons of a different gotra) it should never be done.

11. Xatriyas (must adopt) (members of) their own family, or in a family, which has a spiritual teacher of the same (Brahminical) Gotra; Vaiçyas amongst Vaiçyas, and Çúdras amongst Çúdras.

12. And (persons) of all castes amongst their classes only, not otherwise. Amongst Çúdras he (the king) may (allow?) also a daughter's or a sister's son to be adopted.

13. No person, who has only one son, ought ever to give (him to be adopted); but a person possessing many sons ought anxiously to do so.

14. A Brahman ought to give a fee to the (officiating) priest according to his ability, a king even a half (of the income) of his kingdom, and a Vaiçya three hundred pieces (of money).

15. A Çúdra even all his property, or if he be poor, according to his ability.

Here ends in the Çaunaka káriká the rule for the adoption of a son.

In order to afford a comparison with Çaunaka's text, and on account of the interest which attaches to all the old authorities, I append the text and translation of Baudháyana. The text is based on my MS. of Baudháyana's work on Gṛihya ceremonies, where it forms the Adhyáya of the second Praçna, corresponding with the Dattakamímámsá, the Dattakachandriká and the Samskárakaustubha.

1. Putraparigraha vidhim† vyákhyásyámah.

2. Çonitaçukrasambhavo mátripitṛinimittakas tasya pradánaparityágavikrayeshu mátápitarau prabhavatah.‡

* Yastvá, R. V. verse 4, 10.—Tubhyámagra, R. V. x. 85, 38.—Somadadad, R. V. x. 85, 41—45.

† Putrapratigraho Samk. Kaust. f. 47, page 2, line 3, Bombay lith. ed.

‡ S'ónite S. K.

3. Na tvekam putram dadyát pratigṛihñíyádvá sa hi samtánáya púrveshám.

4. Na tu strí putram dadyát pratigṛihñíyád ványatránujñánād bhartuh.

5. Pratigṛihñíshyannupakalpayate dve vásasí dve kuṇḍale angulíyakam cácáryam* vedapáragam kuçamayam barhiḥ paṇamayamidh-mamiti.

6. Atha bandhúnáhúya† madhye rájani cávedya paṛishadi vágára-madhye bráhmaṇánannena parivishya‡ punyáham svastyṛiddhimiti vácayitvá.

7. Atha deva yajanollekhana§ prabhṛityá prañítábhyah dátuh samaxam gatvá putram me dehíti bhixeta.||

8. Dadámí¶ títara áha.*

9. Tam parigṛihñáti† dharmáya tvá gṛihñámi samtatyai tvá gṛih-ñámi.

10. Athainam vastrakuṇḍalábhyám angulíyakena cálamkṛitya paṛidhánaprabhṛityágnimukhát‡ kṛitvá pakvánnam§ júhoti.

11. Yastvá hṛidá kíripá manyamána iti puronuvákyámanúceya riviktá|| yasmai tvam sukríte játaveda iti yájyayá júhoti.

12. Atha vyáhrítir hutvá svishṭakṛitprabhṛiti siddhamádhenu-vara pradánát.

13. Daxinám dadátyete eva vásasí ete eva kuṇḍale etatcángu-líyakam.

14. Yadyevam kṛitvaurasah¶ putra utpadyate turíyabhâgesha* bhavatí ti smáha baudháyanah.

1. "We shall declare the rule for the adoption of a son.

* Angutíyaka ácharyam. Datt. mím.

† Niveçanamadhye Datt. mím.—niveçanasya madhye Datt. cand.

‡ Bráhmaṇavágálambenopaviçya, sitting down according to the order of the Brahmans.

§ Devayajamánollekha. S. K.

|| Bhixet. Datt. mím. and Datt. cand.

¶ Dadáníto.

* Áha left out by S. K.

† Atoham parigṛihñámi S. K. tam parigṛihñáti Datt. mím. Datt. cand. reads parigṛihñámi in every case for gṛihñámi.

‡ Agnimukhán S. K. agnimukham Datt. mím.—Datt. cand.

§ Paktvá Datt. mím.—tyaktvá Datt. cand.

|| Anúdyá, Datt. mím. and Datt. cand.

¶ Evamtvaurasah. Datt. mím. Datt. cand.

* Turíyabhâge prabhavatíti. S. K. turíyabhâgesam bhavatíti. Datt. mím. and Datt. cand.

2. “(A son) is produced from the seed of the male and the blood of the female. His mother and his father are the cause of his existence. His mother and his father have (therefore) the right to give him away, to abandon or to sell him.

3. “But nobody should give or receive an only son. For he is (wanted) to continue the line of his ancestors.

4. “But a woman should neither give nor receive a son without the permission of her husband.

5. “(A man) who is about to adopt a son, procures two garments, two earrings, and a finger-ring, a priest who has studied the Vedas to their end, a layer of Kuṣa grass, and fuel of Pálāṣa-wood. Thus (is the rule).

6. “Then, having invited his relations to his (dwelling) and informed the king (of his intention to adopt), and having, in the assembly or in his dwelling, served the (invited) Brahmans with food, he should cause them to pronounce the benedictions: “(May) the day (be) auspicious! Hail (to thee)! Prosperity (to thee).”*

7. “Then having performed the ceremonies, beginning with drawing the lines on the altar, and ending with the placing of the water vessels, he should go to the giver (of the child) and ask him (saying): Give me (thy) son!

8. “The other answers: I give him.

9. “He receives him (the child with these words): I take thee for the fulfilment of (my) religious duties; I take thee to continue the line (of my ancestors).

10. “Then he adorns him with the (above mentioned) two garments, the two earrings and the finger-ring, and having performed the ceremonies beginning with the placing of the (pieces of wood called) paridhis, (fences around the altar) and ending with the Agnimukha,† he offers boiled rice into the fire.

11. “Having recited the Puroṇuvākya‡: ‘Who thinking of thee

* All the verbs down to ‘he should ask’ stand in the text, in the absolute. I make a division after vācayitvā, as the first part of the preparatory ceremonies before the Homa closes with the puṇyāhavācanam. The formula of this rite is the following: The performer says, Sirs, wish (me) an auspicious day! Brahman: Om, may the day be auspicious, etc.

† I am not certain about the meaning of this word. But it may possibly indicate the oblation to Agni, which are offered to the eyes of this god, i. e. in the north-eastern and south-eastern corners of the altar.

‡ Taitt. Veda. i. 4, 16. The yastvāyājya is found in the same kānda.

with a discerning mind,' &c., he offers an oblation with the Yájya : 'To whom the performer of good deeds,' &c.

12. "Then having offered the (oblations accompanied by the recitations of the) Vyáhr̥itis, he finishes the ceremonies, beginning with the oblation to Agni svishtakṛit, down to the presentation of a cow and presents (to the officiating priest).

13. "He presents (to him) as sacrificial fee, those two pieces of cloth, those two earrings, and that finger-ring (with which he had before adorned the child).

14. "If after the performance of these rites a (legitimate) son is born (to the adopter) (then the adoptive son) receives a fourth of (the son's) share. Thus says Baudháyana."

It now remains for me to return to the question, how far the recovery of the Çaunaka káriká affects the law of adoption. This chapter of the Hindu law is in a worse state than any other, chiefly because there is not, as in the case of Inheritance, Divisions, &c., for each school of lawyers one paramount authority, which lays down its fundamental rules and its principles. The Dattakamímámsá of Nanda Paṇḍita, it is true, enjoys a certain esteem all over India, but, in the Bombay Presidency at least, not to such an extent, that it would overrule the conflicting opinions of all other writers. On the contrary, besides this work, the Bombay Pandits always consult and frequently follow four other works, the Vyavahára-mayúkha, the Nirṇayasindhu, the Samskárakaustubha, and the Dharmasindhu.

On account of this state of things, the Hindu lawyer will be called upon to examine the principles on which the conflicting opinions rest much oftener in this part of the law, than anywhere else. It is therefore also most important to possess the ancient original works in their integrity from which the modern writers profess to draw their opinions, and to know their history and critical condition.

One of the points in the law of adoption, on which views directly opposed to each other are advocated by writers of eminence, is the question whether a Hindu widow has the power to make an adoption.

Nanda Paṇḍita distinctly denies her right to do so under any circumstances whatever. Nílakanṭha, the author of the Mayúkha, permit it, provided the widow has obtained the permission to do so from her husband before his death, or can procure the sanction of her rela-

tions and guardians after his death. The Nirṇayasindhu, the Samskāra-kaustubha, and the Dharmasindhu declare that a widow may adopt without the permission of her relations.

The advocates of the latter opinion give, as one of their principal arguments, the second half of the first verse of the Ṣaunakasmṛiti, where they read: 'Vandhyá mṛitu putrá vápi.' 'A woman, who is childless or whose sons have died (may adopt).' If this reading were correct, a widow would certainly have the right to adopt, as she pleases. But I have already pointed out in the note appended to the text, that it is wrong, and perhaps a clumsy forgery of the advocates of the widows' rights.

This example will suffice to show, how the recovery of the original Smṛitis may be turned to some use for some practical purpose in the discussion of points of the Hindu law, important even if their importance for the reconstruction of its history be left out of sight.

Notes on Atranji Khera or Pi-lo-shan-na of General CUNNINGHAM, (vide Continuation of Report for 1862-63, No. VIII. page 15.)—By C. HORNE, Esq., C. S.

[Received 5th January, 1866.]


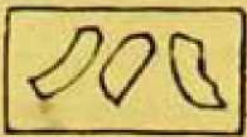
This morning Dr. Tyler kindly drove me, by a country road viâ Rah and Sirnow villages, some ten miles to the village of Achulpow, nearly north of Etah, crossing, when within a mile of the said village, a ravine styled the Kalee Nuddee. Just beyond this village, of which it forms a part, rises the huge Khera or Mound, which, I was informed, contains in its area 500* statute beegahs of land. The height varies from 40 to 50 feet, and it forms a very imposing object, and is covered with scattered broken bricks and fragments of pottery of great thickness, being likewise garnished with a few bushes and two or three peepul trees.

The circuit, as by the measurements of the Moonshee deputed by General Cunningham, is as follows:—Length at base 3,250 feet with a breadth of 2,550 ft. The general form is rectangular, although it is

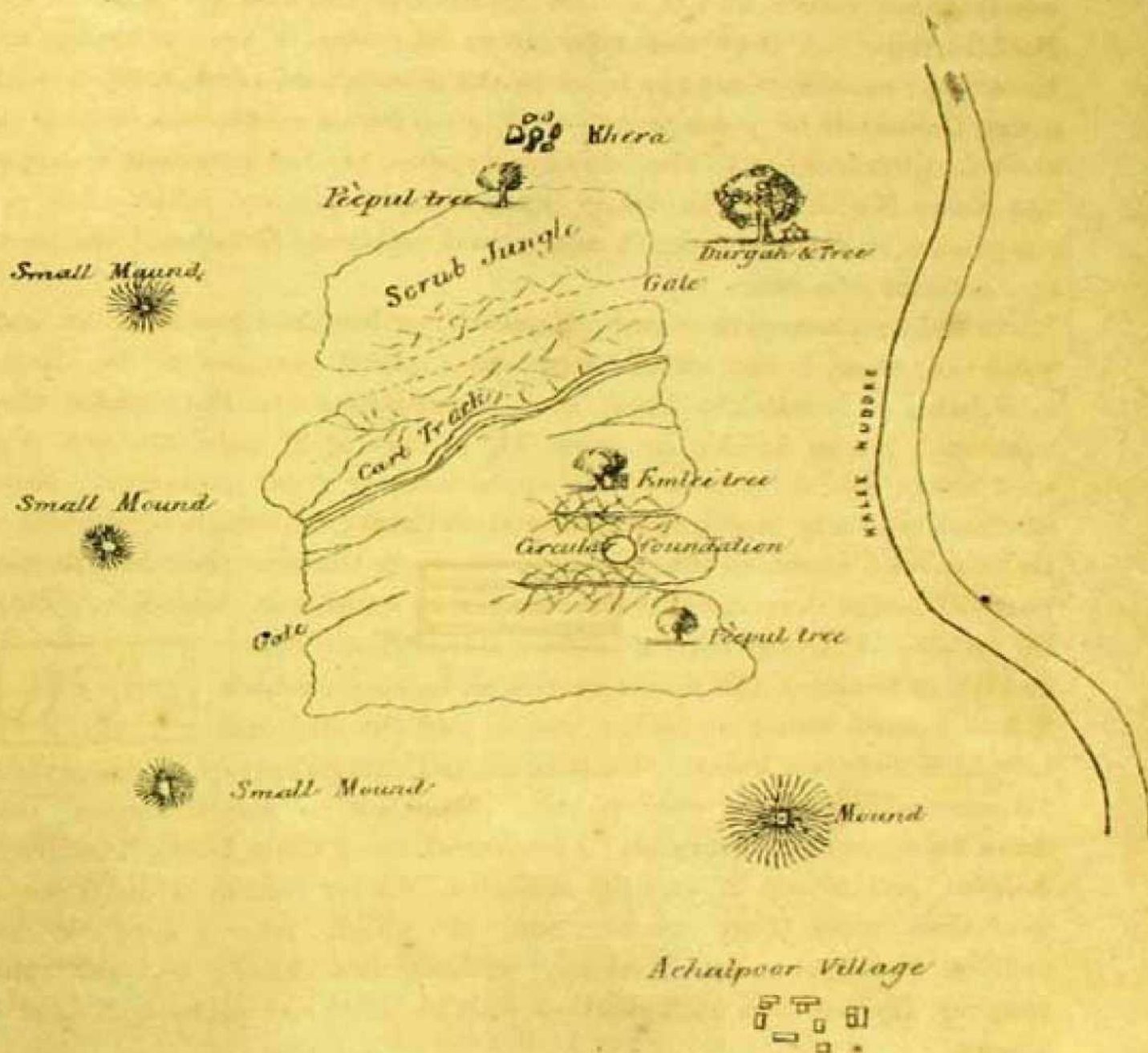
* Equal to 198½ acres.

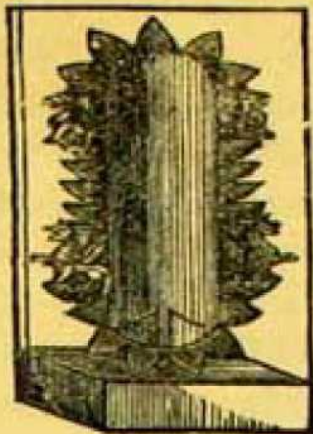
not quite regular; and there are two openings, evidently artificial, called "gates" by the natives. These are at their base about 75 feet in width, and they had buildings on either side. One of these is on the east side near to the north-east corner, and the other on the west side near to the south-west corner. There is also a modern cart-track running through the midst in a kind of hollow.

The surface of the Khēra undulates much, making a series of miniature downs. This effect has been caused chiefly by the agency of water; but there were doubtless elevations and depressions in the original city, the site for which was finely chosen. Around the whole is cultivation, and at a little distance in the east flows the Kalee Nuddee river, so that the view from the top is very striking and beautiful; masses of mango trees in the distance fringed in front with many thousands of palm trees, with a carpet of green winter crop at their feet, stretching to the shining expanse of the bounded water of the Kalee Nuddee in the foreground, form a picture which led my companion to remark upon it, and would captivate the eye of the most apathetic of observers.

At the south-eastern corner, distant a few hundred yards, is an out-work—a mound on which had once stood extensive buildings, now being excavated to their very foundations for the bricks they contain. These bricks measure $14'' \times 8\frac{3}{4}'' \times 2''$ only, are not very well burnt, and do not carry the appearance of great antiquity. None of them bore any inscription stamped on them; although some seemed to have been moulded thus:  as though they had formed part of some ornamental moulding, and I was told of others bearing marks like this;  evidently those of the finger on the moist clay—which I have often found in other places, and the meaning of which I do not know. On this mound, irregularly placed, are three lingams which appear very recent. They are of sandstone and may have been cut from columns. I measured one of them 1 foot 6 inches in height, and about 2 feet in diameter, whilst within a small recent enclosure were two more: one of which was placed in the middle in a pavement of stucco, without any *Yoni*; and the other leaning against the back wall—a slab in relief and perhaps 5 feet in height.

ROUGH PLAN
 OF
ATRĀNJI KHERA
 OR
PI-LO-SHUN-NA
 near Etah. N.W.P.





I give in the margin a rough sketch of the last mentioned, and may remark that none of them appeared to have been much worshipped—if at all.

Also leaning against the wall was the figure of a four armed figure of Durga, in relief on a slab, treading on a prostrate form. This was of no antiquity.

After ascending the mound at the south-east corner and proceeding perhaps two or three hundred yards, we came upon a small eminence, by no means the highest point of the Khera, where foundations have been excavated. These foundations appear to have been circular and to have had for diameter about 54 feet, an ample base for the support of a tower of 100 feet, as described by the Chinese travellers.

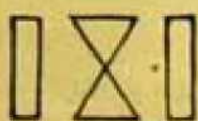
Proceeding still farther north and keeping at a distance of about 100 yards from the eastern face, we came to another mound in which the excavated trenches shew a building to have once stood. The thickness of the foundation walls would indicate a building of some elevation.

This eastern face runs nearly parallel to the Kalee Nuddee, and proceeding in the same direction, we came to the "gate" before alluded to.

On the other side of this, the mound is higher, and is now covered with scrub jungle of Korunda and Bair, inhabited only by black partridges, hares, plovers, and large grey owls.

This is used as grazing ground by the villagers; and it is here, in and after the rains, that the herd boys find the old silver Hindu coins, six of which were given to me by the Zemindar of Achulpoor, Kullian Sing Thakoor, a most obliging guide, whose son takes an intelligent interest in the Khera.

These coins were all of the same type, viz. the nail-headed character,



the marks here indicated being often found on them.

On this part of the mound undoubtedly stood the principal buildings; although I could not trace even

a single foundation.

To the north was visible, at a short distance, another outwork which had originally borne a building, but the mound was much lower and smaller than that at the south-eastern corner. Continuing round the mound, I came at another place to foundations of no note, and saw to the west three smaller mounds, in which no traces of buildings, save broken bricks, probably thrown on them from the fields, remained.

I also came to the other gate, after crossing the cart-track shewn in the plan. The circuit, which I did not measure, might have been about two miles.

The fact that this mound has served as a huge brick kiln to the surrounding country, lying within a radius of eight miles, for the past 7 or 800 years, readily accounts for the absence of all other traces of buildings, and it was with the greatest difficulty I was able to find an entire brick to measure, and I much fear that no good would result from any excavation made in this spot. Block kunkur must have been used instead of stone, and all the remains of this have been utilized by succeeding generations for lime and road-making, so that not a trace now remains.

Etah, December, 1865.

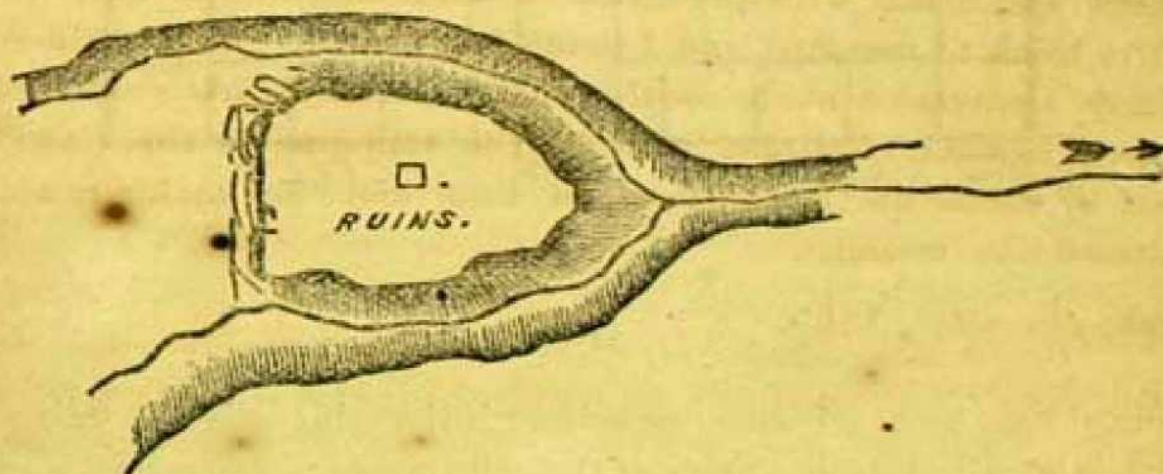
Notes on some Buddhist Ruins at Doob Koond.—By Captain W. R. MELVILLE, in charge, Gwalior Survey.

[Received 31st January, 1866.]

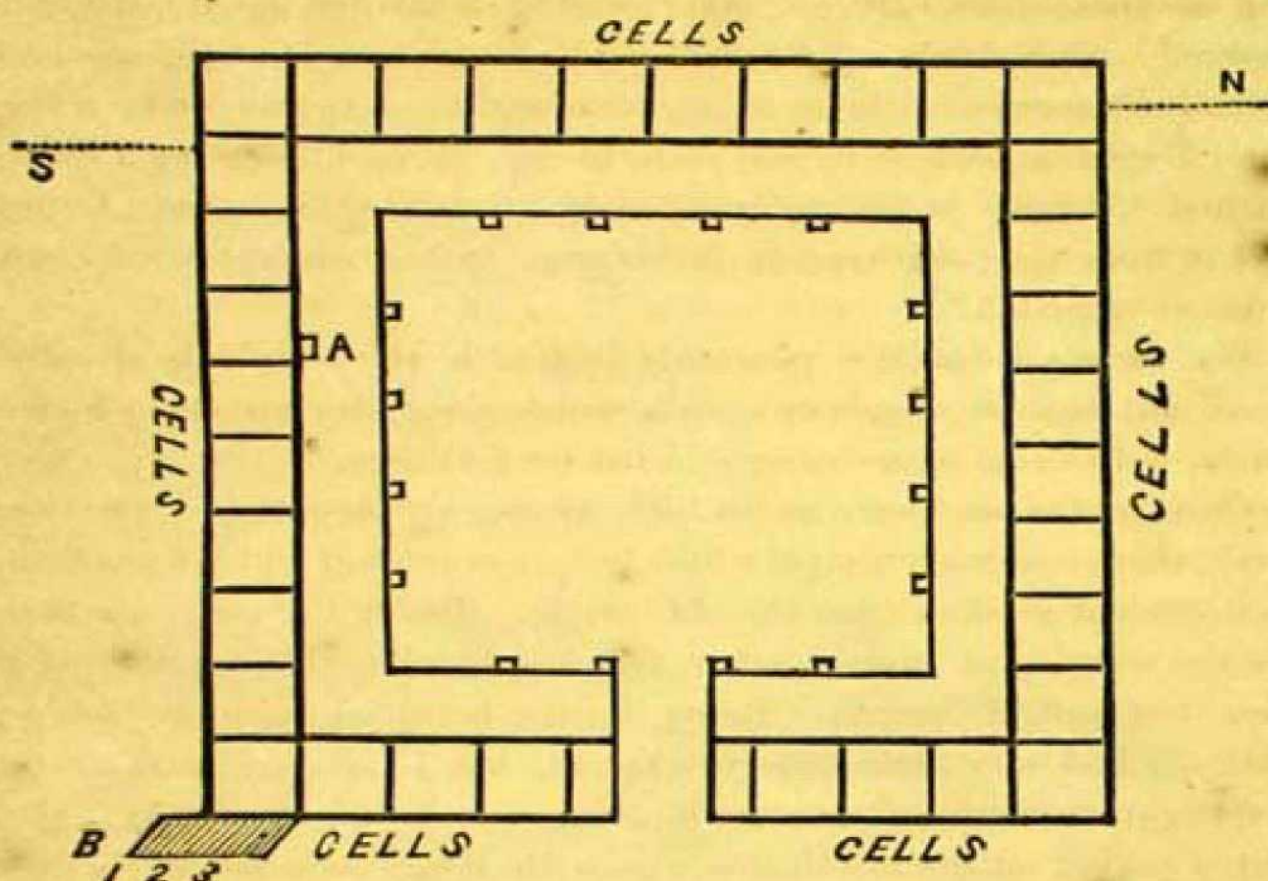
I discovered the other day some totally new Buddhist ruins and an inscription, two copies of which are sent in a tin case with this note.* I have also taken five photographs of the sculpture in different parts of the temple, but I shall be unable to print off copies until my return to recess quarters in April. This temple is situated in the dense forest on the left bank of the Koonoo river, one of the southern tributaries of the Chumbul. I first passed through these jungles in the cold weather of 1863, and I always, from the first, had an idea that these

* The inscription will be published hereafter. ED.

jungles had formerly been much better inhabited than now, but though I have always been looking out for some remains of old buildings, these are the first of any importance I have come across. This temple is situated about three miles almost due north of the village of Buryon in the Keruhl Tehsil, at the place where the Purney river (which up to there runs along the surface of the ground) first begins to form what is called a Kho, or a narrow valley with perpendicular sides. The place is called Doob Koond. The origin of the name, according to the native tradition, is mentioned in the enclosed Memo. The temple is situated in the middle of a fortified enclosure situated on a peninsula, the neck of which is defended by a fortified



wall (as shewn above), and all around it there is a mass of ruined houses and the remains of several smaller temples, in which, however, I was unable to find any inscription. The centre temple, which seems to have been the most important, and in which the inscription was found, seems to have been a square about 100 feet each side, with an open court in the centre surrounded by cells, each of which seems to have been devoted to the worship of some particular divinity. There is only one entrance, on the eastern side, and that side has only seven cells, while the three others have 8 each, making a total of 31. There is a covered verandah running all round outside the cells. The following sketch will give a rough idea :



A. Inscription cells.

B. 3 large statues.

The carving that remains, especially inside the cells, though much injured, is most beautiful. Each of the cells seems to have had a sort of arched canopy carved with elephants, &c. and supported by two figures, one on each side. Below this canopy is a sort of pedestal, on which, I conclude, stood the image of the Deity to whom the cell was dedicated. The elephants are beautifully carved, and their attitudes very natural, and not at all stiff. Just on your left, as you enter, are three large statues of male figures, quite naked and standing. The largest is in the centre. They each have a sort of canopy over their heads, and on the glory round the head of the principal figure you can still see marks of paint. Many of the figures inside also seem to have been painted. The three large figures inside are buried in debris up to their waist. The temple is built of large blocks and slabs of sandstone, which are not, I think, cemented. The roof to each of the cells is formed in the following way: on the first four slabs placed square, smaller blocks are laid across the corners, and on the

top of these four smaller slabs forming a smaller square, which is covered with a single square slab. The inscription is at the southern side of the temple; it is an oblong slab, and the letters have been very carefully sculptured on it, and seem to have been filled with a sort of enamel. It has a projecting stone over it, intended, I suppose, to protect it from the weather; it is between two of the cells under the covered verandah.

On each side of the peninsula on which the temple is situated, there are two deep pools or koonds which never dry up, and which, I fancy, led to this place being selected for a village.

Outside the enclosure and a little higher up the river, on the river bank, there is another temple which looks modern, but which has a figure in it evidently taken from the old temple. Inside the enclosure there are the remains of several other temples, but I could find nothing in them but broken images. Being busily occupied with my survey duties, I had very little time to explore, but I dare say that careful investigation would bring something more to light. The only way I had of taking off the inscription was with blue chalk, but as this was not as distinct as I wished, Baboo Joala Pershad, one of my native surveyors, was kind enough to copy the inscription for me, and I enclose a memo. he made about the temple at my request. I was unable to photograph the inscription on account of the want of light and the smallness of my lens. I hope that the inscription may throw some light on the date of these interesting ruins.

It is a curious fact that these ruins were unknown to any of the natives, except the sheriahs or half savages that inhabit this jungle.

CAMP GWALIOR TERRITORY, *via* AGRA,

January 25th, 1866.

Memorandum about the Doob Koond Temple, by JOALA PERSHAD.

The inscription, as far as I can read it, states that in the year 741 of the Christian era, this temple was situated in the village of Mahabux, and that it was dedicated to the gods—Nemji, Sri Budya, and Chinamusta.

• In 688, Umr Sing and Beja Sing, gooroos, came by the order of Muharaja Chundruk in the reign of Behram Sing.

In the reign of Behram Sing, Pandoo and Gubraj, two brothers,



repaired the temple and instituted the worship of Chunder Perboo, and made two baolies, one on each side, the one on the north was called Umr Sing Baoli, and the one on the south Beiya Sing Baoli.

The old sheriahs have a legend that Behram Sing and the two brothers came to see the temple when it was finished, and all the images burst out laughing. Berham Sing then ordered lime to be put on their faces.*

All the legends about this place seem to show that formerly it was a very celebrated temple and a great place for pilgrimage. They state that (at a date unknown) many years ago a raja† from the west came with an army to this temple, carried off the gold and silver images, broke up the other sculptures, and threw a large portion of them into the koond, and ever since the place has been deserted and called *Doob Koond*.

Some objections to the Modern Style of official Hindustani.—By F. S. GROWSE, M. A. Oxon. B. C. S.

[Received 23rd July, 1866.]

As the pages of the "Asiatic" have admitted an elaborate defence of the modern fashionable style of Urdu composition, I trust that a brief statement of some of the arguments on the opposite side of the question, will find equal toleration.

The Urdu champion has undoubtedly made the best of his case, but he appears to have misapprehended the object of the Hindi party, and therefore many of his arguments are directed against an imaginary opponent. With the possible exception of a few visionary enthusiasts, I am not aware that any one in the present day is prepared to advocate a return to Hindi pure and simple. Such a thing would be practically impossible, on account of the number of foreign words which have won for themselves a secure position in popular speech. I consider this to be really the valid reason, and attach no weight whatever to the alleged varieties of dialect; for I feel convinced that the language of the Prem Sagar, in which not the slightest taint of an alien element has been allowed, would be more

* I fancy this refers to the paint on the images that still exists.

† Probably a Mussulman rival.

generally understood throughout the length and breadth of India, than any equally polished specimen of Urdu. This statement, indeed, may be called a mere *ipse dixit*, but its truth is susceptible of a very easy test. However, as I have already said, Hindi so absolutely pure and undefiled, finds few advocates; and there can be no doubt that the Baital Pachisi, where a judicious mixture of Persian terms has been admitted, would be much more easily and widely intelligible than the Prem Sagar.

The only foundation for the belief that Hindi is an arbitrary name for a group of vulgar dialects, which have little in common and could not be reduced to one standard, is the practice of the early Missionaries, each of whom set about compiling a dictionary for the district in which he happened to be placed. But if we compare these local glossaries together, we shall find that a very large proportion of the words occur equally in all. To test this statement, I take down a Panjabi dictionary which I have at hand, and open it at random: the first word at the top of the page is *palit*, filthy, which is Sanskrit, and the last word *par-nāni*, a maternal great grandmother, which is good Hindi; of the other forty-six words in the same page there are only nine which are at all peculiar, though there are several divergencies from the recognized mode of orthography. And the varieties, so far as I can judge, appear to be of two kinds: 1st, the most common of all natural objects are known by several designations, of which one will be most popular in this district, another in that; while the other names will remain in the back ground, perfectly well understood, though less frequently on the tongue. As an example of what I mean: a *tree* in Bengal proper is generally called *gáchh*, in the N. W. Provinces *per*, and in the Hills *briksh*; but a native in any part of the Bengal presidency who did not know the meaning of *per* would be a phenomenon. 2nd, Agricultural implements, or rather the component parts of such implements, with the domestic articles of daily use, are known in different quarters of India by very different names. But for the most part these things, being suggested by the peculiar wants and habits of the district, have no foreign name whatever, and in superfine Urdu can only be expressed by a periphrasis. Local differences of these two kinds do not, in my opinion, at all impair the integrity of the language. But unfortunately a good Hindi dictionary

is up to the present day a complete desideratum ; nothing of the kind has ever been attempted ; and I should be delighted to see some Pandit come forward, with sufficient zeal, patriotism and learning, to undertake such a task ; a dictionary, I mean, which would comprise all the words used by Tulsi Dás in the Rámáyana, by Chand the Bard of the last Hindu kings, by Bihári Dás the author of the Satsaiya, and the other classical Hindi poets. I am convinced that such a work would not only be of the greatest interest to a philologist, but would incontestably prove that Hindi is an independent language, elaborated by a series of able writers and guided by a definite standard, which from time to time has varied in degree, but never in character.

Having so far cleared the ground, I will proceed to defend the position taken up by those who protest against the continuance of the present *Kachahri boli*, and still more against its recognition as the literary language of the country. In the first place, it is a recent innovation, which had positively no existence whatever fifty or sixty years ago. Mr. Beames incidentally speaks of Urdu writers three or four centuries back, but I must confess that I have never heard of them. The Mahommedans subdued the country, but never succeeded in destroying the language of the conquered people, nor does it appear that they made the attempt. As late as Akbar's reign and for many years subsequently, the popular dialect of both classes was the same ; and if a Musalmán took in hand to write on any subject of general interest, especially if his taste led him to adopt a poetic form, his composition was couched in Hindi. Several of the poems in the Sabhá Bilás may be mentioned as specimens, in which the only Persian word that occurs is the name of the writer. If a more ambitious historical narrative were attempted, he discarded the vernacular altogether, and wrote in classical Persian, precisely in the same way as European scholars, till a very recent date, wrote all their more important works in Latin. Arabic too, was continued as the language of the law-courts, as Norman-French in England, simply as a matter of convenience to conform to the phraseology of the original codes ; and this eventually was modified into Persian with the retention of a large proportion of Arabic words and phrases. Of course, as time passed on, many foreign words were incorporated into the popular dialect ; even in the Rámáyana of Tulsi Dás we find at least two, *jawáb* and *bakshish*, and,

as I cannot speak positively with regard to so voluminous a poem, there may probably be a few others. But it appears to have been considered bad taste rather than otherwise in a professedly vernacular composition, to introduce many words of Persian or Arabic origin. At the beginning of the present century the proportion of foreign and native words had come to be about equal, in works composed by Mahomedan writers in a popular style. A new principle then came into operation, which checked the natural progress of development, and threatens to rob India of all it has hitherto acquired in the way of literature. The change to which I allude was the abolition of Persian as the language of the law-courts. Till that time official and popular language had been content to remain apart; now they were to coalesce. We all know what has been the result of this well-intentioned order: the *amla* had written nothing but Persian all their lives, and in fact could not trust themselves to write anything else; they acquiesced in the Government demand so far as to introduce the Hindustani inflexions into their pleadings, but the phraseology was preserved intact. This is the fortuitous origin of that wonderful jargon, which is now not satisfied with ruling the law-courts, but requires to be acknowledged as the standard of good taste throughout the whole of Hindustan; which has retained the verbosity of Persian, while sacrificing the elegance and simplicity of its grammatical construction, and has introduced the complex inversions of Hindi syntax, while discarding the terseness and vigour of its terminology. By all means let the language of the country be Urdu, that is to say the Urdu of thirty or forty years ago, having for its basis Hindi with a free admixture of all foreign words, for that is the form into which it had spontaneously developed, and eclecticism may be tolerated or even admired, while syncretism in art must be synonymous with failure.

2. Not to dwell further on its artificial origin, this Urdu dialect can never advance to the dignity of an independent language; and yet certainly India is too considerable a country to acquiesce quietly in the position of being, for literary purposes, merely a province of Persia. The great ambition of every Munshi now-a-days is to eliminate from his composition every Hindi word, no matter how far-fetched its Persian substitute may be. With regard to other languages he is not so particular, and will introduce English phrases with great

gusto, often with a singularly ludicrous effect. He only studies to conceal his Indian origin; yet, do what he can, he cannot get rid of those troublesome inflectional terminations and auxiliary verbs, and, after all his misapplied labour, the pedantic sentences, which nothing can induce him to call anything but Persian, remain hopelessly and unalterably Hindustáni. He has probably succeeded in making it unintelligible Hindustáni, but still Hindustáni it is and must remain, and no native of Iran could pronounce it to be more than some very provincial type of true Persian. Such a position appears to me highly undignified; while, on the other hand, if the Hindi basis were frankly recognized and worked upon, the result would be a genuine national inheritance. I will here give a few of the most common Hindi words which are banished from the Kachahris, and place opposite to them their fashionable substitutes.

<i>Hindi.</i>	<i>Foreign.</i>
Betá or larká,	Pisar or walad.
Báp,	Wálid.
Chándi,	Nukrá.
Tel,	Raughan.
Ghi or ghrit,	Raughan-e-zard.
Gehuñ,	Gandum.
Gáñw,	Mauzá.
Brihaspati,	Juma-rát.
Chori,	Sirika.
Byáh,	Izdiwáj.
Bakri,	Gospand.
Len-den,	Dád o sitad.
Sunár,	Zargar.
Kúá,	Cháh.
Nidán,	Akhir-i-kár.
Kachha,	Khám.
Alag,	'Alahida.

The last word *alag* is of good Sanskrit descent, but I am sure nine-ninths of the Munshis look upon it as merely a vulgar corruption of 'aláhida, in the same way as *nagich* is of *nazdik*. So far as the above list goes, and it might be indefinitely extended, all the words in the Hindi column appear to me, some from one reason, some from another,

to be decidedly preferable to their foreign substitutes. The only reason for displacing them is the insane desire of inventing a language for India with every Indian element eliminated. This principle is carried to such an extent, that if a foreign substitute cannot readily be found, the native word is dressed up in foreign fashion ; thus for *chachera*, a perfectly regular derivative, we are presented with the mongrel malformation, *chachá-zád*. And even one step beyond this : a dead set is made against the unfortunate letter *j*, which, as the Hindi representative of *z*, is considered decidedly vulgar, and occasionally banished even from Persian words, where till the present day no *z* had ever been known to intrude. Thus we have *fauzdári* for *faujdári*. When this is the case, it is no wonder that the *z* should be exclusively adopted in those instances of not very unfrequent occurrence, where there is some authority for its alternative use. Thus we have *jánu*, perfectly good Sanskrit, and *zánu*, equally good Persian, for a knee ; or to take a word of every day occurrence, *zát* is no doubt unimpeachable Persian, but *játi* is the original Sanskrit, and therefore the proper form for retention in the language of India. Yet I feel sure that an ordinary munshi would shudder to say *ját* ; though it stands to reason that, as caste prevails solely amongst Hindus, the popular word to denote it must be of home origin. *Zát* again is a word which stands by itself, without association or connection ; while *ját* at once refers us for its explanation to the cognate forms, *jan*, *janm*, *janná*, &c.

3. The adoption of this Persian dialect as the language of the country involves the necessary abandonment of the Nágari character. With reference to its original purpose the Nágari alphabet is the most scientific that human ingenuity has ever elaborated, but it is utterly inadequate for the representation either of Arabic or Persian. On the other hand the Persian character, as ordinarily written, is almost equally destructive of Hindi phraseology ; and it is interesting to watch the gradual inroads which it is making on vernacular speech. The court munshis, who, as a rule, have never read a page of any Hindi book, pronounce every word according to its Persian orthography, which in many cases is a very imperfect representative of the original Hindi form ; and as they are considered the depositaries of learning, their example is imitated, the mistake is perpetuated, and

gradually penetrates through every class of society. For example, all Hindi words ending in an unaccented vowel which would be clearly marked in Nágari, lose their termination in Persian writing, where all the vowels, final or medial, are more or less obscured. Thus, *pati*, so frequent in proper names, as Nírpáti, Dhanpati, Brihashpati, is abbreviated into *pat*. Again, the Sanskrit *v* or *w* is generally corrupted by the defect of the Persian alphabet into *o*; thus we have *deo*, *Baldeo*, *deota* for *deva*, *Baldeva*, *devatá*. Hence too arises the uncouth word *Doear* rendered familiar by the disturbances in Bhután, which, if correctly spelt, is only the common Hindi *dwár*. As for the short vowel *w*, it admits an alternative error, being either dropped altogether, or written with the long *wao*. The Sanskrit compound consonants again cannot be clearly indicated, and in consequence we get the corruption *kariya* for *kriyá* in the common phrase for funeral rites, *kriyá karm*. It is highly desirable that some scheme should be started which would enable the two systems of writing to exercise a mutual check upon each other; the Nágari completing the deficiencies of the Persian, and the Persian acting as a short-hand auxiliary of the Nágari. And there would be no practical difficulty in such an arrangement, if only it were once clearly recognized that the vernacular is a composite language, in its essential structure Hindi, but in its component elements Hindi and Persian in equal proportion. The division of the vernacular into Hindi and Urdu was a most unfortunate invention of the munshis of the College of Fort William at the beginning of the present century, and has never been generally recognized by the natives. I do not think that any one, who had not been specially brought under English training, would dream of calling his native tongue Urdu; and, as I have before stated, Hindus and Musalmans alike, till very recent times, used one dialect for popular composition, though the Hindu, from early association and perhaps also from the nature of his subject, which would often be mythological, would naturally, though not inevitably nor uniformly, use more Sanskrit words, and the Musalmán, from the nature of his religion, more Persian words. It is now high time that these fanciful distinctions should be again merged into one, and the language of the country, according to universal analogy, be known by the name of Hindustáni. I cannot see any good to be gained by the retention of

the word Urdu, which certainly does not err on the side of self-laudation, being literally bazar *lingo*, and therefore, on its own shewing, unworthy to be brought into competition with Nágari, the refined and urbane.

If the language were once settled upon a composite basis, it could be expressed equally well by Persian or Nágari; and here I would make a suggestion, which I scarcely hope to see ever carried out, though I am convinced that it is perfectly practicable. I would reserve the Persian character for epistolary purposes, and records of transient interest; while I would have all permanent records and all Government printing in Nágari. It is notorious that any proper name, to which the clue has been lost, can never be deciphered with absolute certainty from a Persian document; and therefore such a style of writing is most inappropriate for the preservation of a record of rights; at the same time it is preeminently a running hand, and its great praise is its flowing elegance which it is impossible to imitate in print. On the other hand, Nágari, though slowly written, is clear and precise; and I believe all who have had any practical experience on the point will admit, that it is better adapted even than the Roman character for printing purposes, because the type is more durable. It may be urged against this suggestion that it would involve the necessity of all officials being able to read and write both Persian and Nágari, whereas now as a rule they are familiar only with the former. This is true, but then the language employed would be their own mother tongue, for the acquisition of which no special training would be required.

4. And this brings me naturally to my fourth point; which is, that the present *kachhari boli* is inconvenient, because it is foreign to all and unintelligible to many. And on a point of this kind, we, being ourselves foreigners, must not trust to preconceived notions: the deliberate judgment of one educated native is sufficient to upset all our theories. Some few days ago I came across a brief History of India, compiled by Bábu Siva Prasád and published by order of the local Government, called the *Timira-násak* (which by the way I may remark is, so far as I am competent to judge, a model of what the Indian vernacular should be, being elegant without pedantry and homely without vulgarity); in his preface the Author distinctly

deplores the fact that the language of the courts is not the language of the country. Similar statements may be found *passim* in the newspapers written and edited by English speaking natives. And it is by no means uncommon to find really well educated Hindus, who will readily admit that they most imperfectly understand and would be quite unable to write the dialect of the *kachahri* munshis. And as a further proof, the official translations of laws and circulars in this pseudo-vernacular are absolutely unintelligible, till they have been interpreted by some one who can compare them with the original English. No doubt there are several current law phrases, for which, as Mr. Beames says, it would now be difficult to find the Hindi equivalents, and I have no objection to their retention; I think, however, their number is not so great as is generally supposed, and should not be unnecessarily increased. For instance, *markúm-i-bála* or *mazkúr i-sadr* is the accepted phrase for *aforesaid*, but it would be incorrect to allege that there was no Hindi equivalent for it, since *upar ukta*, though now somewhat unfamiliar, is equally elegant and correct. I think too that Mr. Beames is scarcely fair in some points of his comparison between Hindi and Persian; *málum* and *matlab* are generally represented by some tense of the verbs *jánná* and *cháhná*; *tajwiz* in colloquial language is accurately expressed by *soch* and *bichár*, either separately or together, and judicially by *nirnay*; *zarúr* is supplied by *cháhiye*; *mawáshi* by *pohe*. And I am certainly surprised to see him rank *jāngal* amongst the foreign words, whereas it is in fact Sanskrit. Nor should I translate *shakhs* by *log*, but by *jan*, which, so far as my experience goes, is universally used by natives when talking amongst themselves, and is perfectly good Sanskrit, though the munshis, for some reason or other, have taken a dislike to it, probably because it begins with the letter *j*.

5. The Urdu of the period is not only unintelligible, but it perpetuates and confirms ignorance. It is so completely an alien form of speech, that in the case of those whom Government compels to employ it, the whole time available for education is spent in acquiring it; and the consequence is, that, as a rule, these Urdu speakers are, in matters of general information, the most ignorant class in the community. In every other case the acquisition of a new language opens a new door of knowledge; but this artificial dialect has neither history

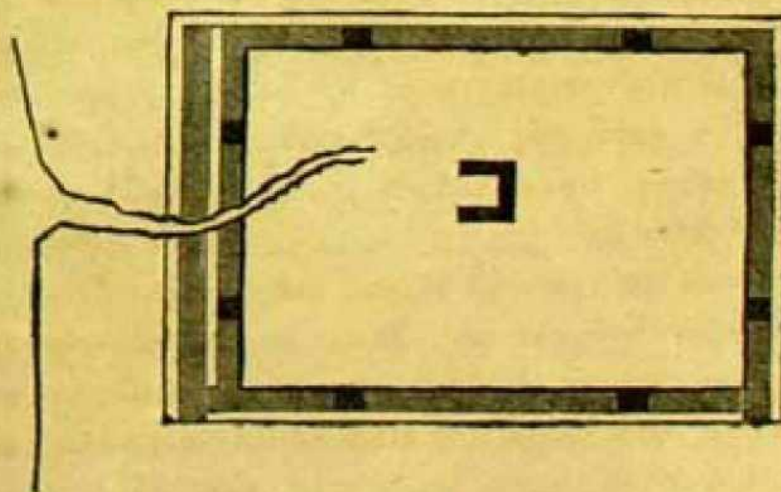
nor literature, unless we choose to class under the latter head the laws and circulars of the Government, which, it must be confessed, are rather dull reading for the masses.

In every way then I conclude that the encouragement of the style in which our munshis delight, is most strongly to be deprecated. It is a style of artificial and unnatural origin; it is incapable of development into an independent national language; it robs the Hindus of their most glorious literary inheritance; it is practically inconvenient, being unfamiliar even to the educated classes, unless they have been specially trained in it; and it perpetuates ignorance by blotting out the records of earlier civilization, and, having no literature of its own, offers none in its place. The law has at all times and in all countries been somewhat pedantic in its utterances, and if it is inevitable, let it remain so; but surely it is an unheard-of thing that legal phraseology should be constituted the type of polite literature.

Description of the Chandrarchhagurh near Sashtanee, Pergunnah Nyegur, Zillah Midnapore.—By W. J. HERSCHEL, Esq., B. C. S.

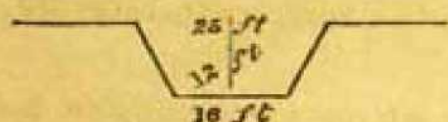
[Received 2nd April, 1866.]

This very remarkable fort lies in the least known part of the district of Midnapore, in the south-west corner of it. I came upon it accidentally while returning from a tour into Morbhunj.



It lies near the boundary of the district in the midst of what, twenty years ago, was uninterrupted jungle, but what is now fast breaking up into cultivation. It is a nearly square patch of thick tangled

jungle lying pretty nearly north and south. Its longest line is east and west. It measures 1,050 yards in this direction, and from north to south 780 yards; so that the circumference is just two miles. It is built with unusual precision and completeness, differing in this from all the other forts I have seen in this district. A perfectly straight ditch on each side with a high bund inside; it has been almost filled up on the northern side and somewhat less so on the western, by the drainage of the country, which at this spot flows S. S. E. The western end of the ditch on the south side has been affected in the same way, the drainage turning southwards round the corner; the northern end of the eastern ditch has not suffered so, because the drainage sets *away from* that corner, and the ditch is not continuous round the corner. At this place, therefore, the eastern ditch is seen in perfection, and a very



surprising work it is. It is cut through solid rock, except the upper two or three feet, and the sides are carefully sloped with the chisel. The rock is the com-

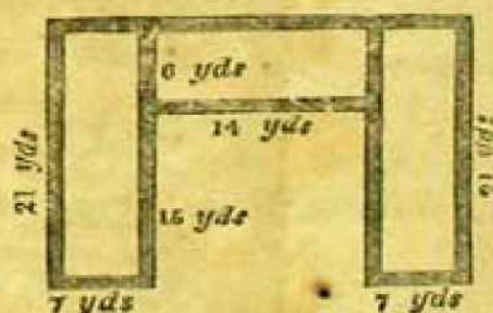
mon Midnapore laterite, not a hard stone to cut, and not a very good one to wear. It is liable to frequent clefts, and is seldom continuous in very large blocks. Consequently the sides of the ditch have fallen in a good deal, but there is ample to shew that when first finished, this ditch was a thoroughly workmanlike production. The soil was removed at the lips of it, and the rock carried up by two or three layers of stone. It is carried all down the eastern face, and turns the corner with almost modern precision, and continues along the southern face till it is silted up at the western end. From the character of the whole fort I am satisfied that, if cleared, the ditch would be found equally perfect all round; on those two faces it is scarcely filled up at all, though overhung with jungle and difficult to get along in consequence.

The bund on this eastern face is about 12 feet high and 50 broad. Within it is another equally fine and well-preserved ditch cut in the same way through the solid rock. This ditch does not go round the other three sides, nor can I say certainly that it goes all up the eastern side, but the natives say it does, and I went along some 100 yards of it, till it got so bearish-looking that the villagers would not go further with me.

About 15 yards within the edge of the second ditch rises the wall of the Fort which, as far as I could follow it, is continuous the whole way round. It was built of excellently chiselled stones of ordinary size, about four or five feet thick, and about 15 feet high, though there is not that height standing anywhere that I saw; 12 or 13 feet I measured. The care bestowed on this wall is most unusual. There is no attempt at extravagant massiness, but what was done was done thoroughly well. At different places are projecting bastions, simple square rooms of 20 feet each way, standing out from the line. They are quite square and clean at the angles. The villagers said there were two such on each side. I think there was also one at each corner.

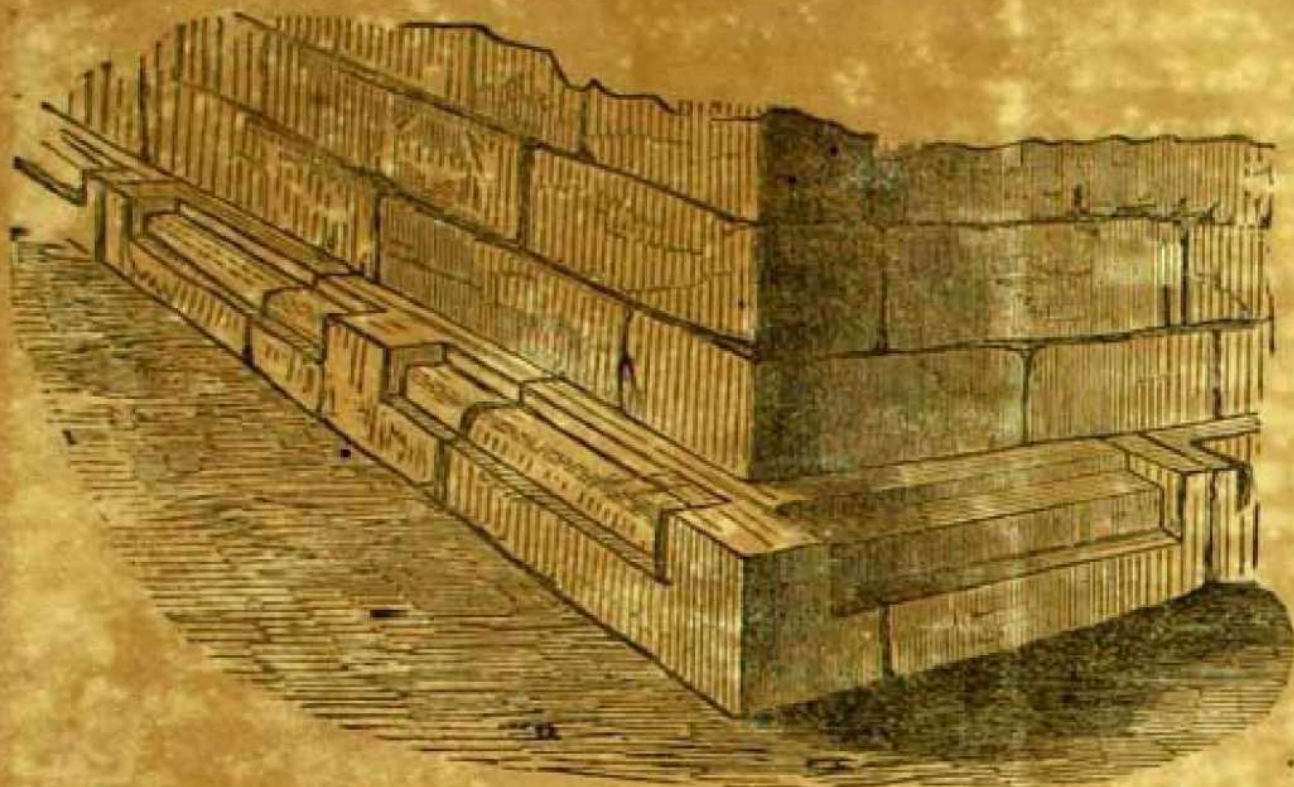
The wall is very much in ruins now, but there is plenty left to shew what a handsome thing it must have been. On the south side is a huge tower in ruins, but that is the work of the Trigonometrical Survey, I believe. It is quite out of character with the rest, certainly, by its very size.

The interior of the Fort presents nothing whatever to suggest habitation, except the one extraordinary building in the centre. In its simplicity, neatness and thoroughness, it harmonizes exactly with the exterior defences. I give a plan of it in the margin. It has but three



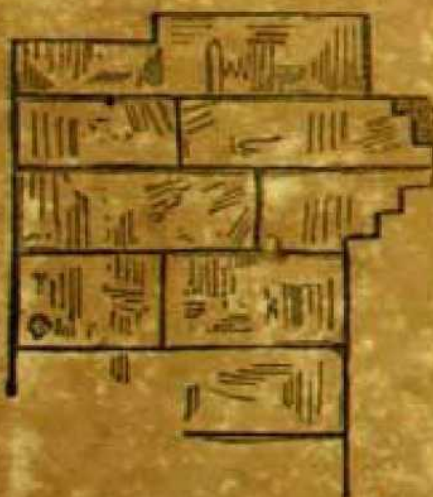
rooms, of the size shewn in the plan. The walls are of the same nicely cut laterite, about 3 feet thick, and 11 feet high from the true ground level to the top of the corncicing. It is not in very good preservation above the 8th foot from the ground, but so far almost perfect. The corncicing is

of the same simple character as the whole Fort, (of the shape shewn in the woodcut on page 184) and runs all round the whole of the three rooms. The upper half of the cornice is like the lower, reversed, but at regular intervals there are little square bosses as at the basement of the wall, which is ornamented in the same simple style, thus:—



These simple rectangular mouldings were the only ornaments or carvings I could detect on a very careful search throughout the whole fort. There is not a curved line in any stone in the whole work. The wall certainly ran up to the height which I have shewn in the sketch of the cornice. I cannot find any stone higher than that, and from the fact that three of the few stones left of that tier have a ledge in

them (as shewn in the margin) on the inner side of the wall, I suppose that the timbers of the roof rested on this tier. The curious part about the building is, that there is not, and never was, any door whatever. I examined the walls everywhere, and by the lines of the stones it is quite clear that it was deliberately intended that there should be no entrance into these rooms, whatever there might have been to the roof. The want of debris shews that there was no upper story. Nor is there any commu-



nication whatever between the three rooms. An entrance has been forced of course, since the place became a ruin, but the position of the stones at the place is still at this present moment such as to shew

that it *is* a forced entrance. There is not a vestige of anything that could have been a stone staircase. The interior of these three rooms is filled in a good deal with rubbish, shewing, I fancy, that there was a roof on them once.

The villagers all say that it has been a puzzle to them for generations why the Rajah Chandraketu, to whom the building of the fort was assigned, should have built his house so. They said, truly enough, that any force that could take the fort, would soon find its way into the house.

Rajah Chandraketu lived, say the rustics, in the Satya Yuga, and was a favoured contemporary of Rāma, who on his march to Lankā stopped here, and found the Rājā engaged in pious worship, morning, noon and night. Before he touched food, he used to perform poojah to one thousand Sivas (Lings). Rāma halted at a place called Tapoban, now of considerable local celebrity as a spot for worship, and in a dream authorized Chandraketu to build a *mandir* to Siva and place in it a Ling having a thousand Murts—that by worshipping it he might, as a special privilege, obtain all the merit of one thousand acts of worship. I went to visit the Sahasra Ling, or rather I had gone there before, and had noticed that it was encircled with ten rows of marks like a continuous *m mmmmm*. The old Burwei of the village told me, and I found, there were exactly 1,000 of these strokes, and on enquiry I was told the story of Chandraketu. The temple is old certainly, but my belief is that neither the fort nor the temple are more than two or three hundred years old. Perhaps the accompanying sketch of the *mandir* (vide plate XXI.) may determine the age of that building at least. It is split by roots and is in a very tottering state altogether. Several of the stones have come down from their places.

Of the family or history of Chandraketu not another word could be learnt. Nothing but the fort and the house have survived him, and judging by them, he must have been a man of simple habits and of rare singleness of purpose and tenacity. Why he should have defended the *eastern* side of his fort at such double expense I do not know. But it was a costly undertaking.

There is no mention of the fort in Bayley's MS. Notes of the Zillah.

Notes on a Tour in Maunbhoom in 1864-65.—By Lieutenant-Colonel E. T. DALTON, Commissioner of Chota-Nagpore.

[Received 16th October, 1865.]

In the district of Maunbhoom, we find two distinct types of architectural remains. Those that appear most ancient, and are said by the people to be so, are ascribed, traditionally and no doubt correctly, to a race called variously Serap, Serab, Serak, Srawaka, who were probably the earliest Aryan colonists in this part of India; as even the Bhumij, who of the existing population claim to be the oldest settlers and whose ancestors had not the skill to construct such monuments, declare that the first settlers of their race found these ruins in the forests that they cleared. We have the same tradition of early settlements of the Srawuks in the eastern parts of Singhbhoom, which were broken up by the warlike Hos or Lurka Coles. The Srawuks appear to have colonized along the banks of rivers, and we find their temple ruins on the banks of the Damodur, the Cossai and other streams. The Cossai is rich in architectural remains. Within a few miles of the station of Poorulia and near that river, are the ruins of an old settlement called Palma. This I have not seen, but Lieutenant R. C. Money has favoured me with a brief account of it. The principal temple is on a mound covered with stone and brick, the debris of buildings, through which many fine old pekul trees have pierced, and under their spreading branches the gods of the fallen temple have found shelter. In different places are sculptures of perfectly nude male figures, standing on pedestals and under canopies, with Egyptian looking head-dresses, the arms hanging down straight by the sides, the hands turned in and touching the body near the knees. One of these images is larger than life. It is broken away from the slab on which it was cut, and the head, separated from the body, lies near. At the feet of each idol are two smaller figures with chowries in their hands, looking up at the principal figure, and on the pediment of each is an animal, differing. I have now seen several of these figures, and there can, I think, be no doubt that they are images of the "Tirthan-caras" of the Jains, who are always thus figured naked or 'sky-clad,' each with its representative animal or symbol. Lieutenant Money

also observed a stone pillar set up perpendicularly, standing 12 feet high by $1\frac{1}{2}$ feet square, with corners chamfered, making it an octagon; and near this four more of the Tirthancaras are found. All about this temple mound are other mounds of cut stone and bricks, shewing that there must have been here, at a remote period, a numerous people far more advanced in civilization than the Bhoomi and Baori tribes who succeeded them. At the village of Churra near Poorulia, there are two very old stone temples called 'Deols' or 'Dewalas.' The only tradition regarding them is, that they and some large tanks in the vicinity were constructed by the Serawaks here called Seraks. They are built with roughly cut stone, without cement, on the *stone carpentry* principle. There were originally seven of these Deols. Five have fallen, and the fragments have been used in building houses in the village. The most perfect of the two that remain, is a tower terminating in a dome of horizontal courses of stone about 30 feet high, with a circular finial like a huge cog-wheel, and the remains of flag-roofed colonnades on both sides. The slabs forming the roof are great blocks of granite from 5 to 9 feet in length, 2 to $2\frac{1}{2}$ in breadth and 1 foot thick. There is no carving about these temples, and no object of worship now in the shrines, but on some of the stones that are scattered about, tracings of the nude "Tirthancaras" are visible. There is another of these temples at Telkoopi on the Damodur; and there is there an image still worshipped by the people in the neighbourhood, which they call *Birrup*. This image I have not seen, but it is probably intended for the 24th "Tirthancara," 'Vira' or Mahabira, the last Jina.

Some four miles south of the town of Jaipore on the right bank of the Cossai river, near the village of Boram, are three very imposing looking brick temples rising amidst heaps of debris of other ruins, roughly cut and uncut stones and bricks. Besides the mounds, on which these temples stand, there are other mounds all composed of similar debris and traces of enclosures, shewing this to have been at one time a very important place. The most southern of the three temples is the largest. The tower rises from a base of 26 feet square. The chamber occupies only 9 feet square of this, and after about 9 feet of upright wall is pyramidal in form, the bricks in rows of first three, then two, and near the top one, gradually approaching, till the four sides meet. The

remainder of the tower is solid brick work throughout. Its height is about 60 feet, but the upper portion of it has fallen, and it is impossible to say how it was finished off. The bricks of which these temples are composed, some of them eighteen inches by twelve, and only two inches thick, look as if they were machine-made, so sharp are the edges, so smooth their surface, and so perfect their shape. They are very carefully laid throughout the mass of masonry, so closely fitting that it would be difficult to insert at the junction the blade of a knife. The entrance to all the temples faces the rising sun. The objects of worship, whatever they were, have disappeared from the fane, but in the southern temple there is a stone gutter through the wall, terminating in a well-carved gargoyle for carrying off the water used in the ablution of the idol. The bricks used for ornamental friezes and cornices appear to have been carefully moulded for the purpose before they were burned; and the design, executed entirely of bricks thus moulded and put together, is, though very elaborate, wonderfully perfect and elegant as a whole; but in some places stucco has been added, and further ornamentation or more delicate tracery attempted in the stucco on the brick foundation, and this tracery, where it remains, is in wonderful preservation. The entrance to the temple is wide and lofty and arched like the interior, that is by the projection, till they meet, of bricks horizontally laid. Door, there appears no sign of. The fane must have been open to the world. The only animals I could discern in the ornamentation were geese, introduced in the scrolls: the goose is a Buddhist emblem.

The other temples are of similar design, but smaller size. In front of them I observed several pillars of stone, but I found no architraves, and the pillars are hardly long enough to have been the support of a covered porch in front of the fane. These three temples are all of the same type, and are no doubt correctly ascribed by the people to the "Srawaks" or Jains. I found indeed no Jain images on the spot, but about a mile to the south, the remains of a Hindoo temple in a grove was pointed out to me, and all the images from all the temples in the neighbourhood have been there collected. The grove temple was dedicated to Siva, but amongst the images were several nude figures like those already described, that were in all probability the 'Jinas' of the brick temple.

Near the brick temples I found, amongst a heap of ruins, a square stone crypt in which was a four-armed female figure finely carved in the style of the sculptures of Dulmi, to be presently described. This was worshipped by the women of the place under the name of 'Soshiti.' In the grove there was a similar figure, and the other images of Hindoo gods found there, appeared to be of the same period. Another mound was pointed out to me about half a mile from the grove as a collection of ruins, but I did not go to it.

The temples of the Maunbhoom District described in a letter from Lieutenant Beavan, published in the Proceedings of the Asiatic Society for April last, are no doubt of the same Jain type. The colossal sculpture, described as worshipped by the villagers under the name of Bhiram, may be another image of the 24th Jina, "Vira;" at all events it is a "Tirthancara" not a Hindoo image.

From the notice of "Vira" in the IXth Vol. of the Asiatic Researches, article Jains, by Profr. Wilson, it appears that he flourished 500 or 600 years before Christ, and after he had adopted an ascetic life he is represented as traversing the country occupied by the "*Vajra Bhoomi*" and the *Suddhi Bhoomi*, who abused and beat him and shot at him with arrows and baited him with dogs; but he tranquilly went on his course, paying no heed to these annoyances. Now Maunbhoom is to this day the land of the *Bhoomi*, or Bhumij. They are a branch of the Moondah race, and were long the terror of the adjoining districts of Bengal. These were no doubt the "Vajra" the terrible "Bhoomi." The other portion of the population, who are not "Bhoomi," are called "Sudh" throughout Chota-Nagpore. It is not improbable that the shrines I have been describing, mark the course taken in his travels by the great saint "Vira," and were erected to his honour by the people whom his preaching had converted; but all these temples are in sight of *Mount Samaye* or Samat, that is the sacred hill from which 250 years before the days of Vira, the Jina Parswa or Parswanath is said to have obtained '*nirbána*' or ultimate repose from the cares of a separate existence; and it may be that colonies of Jains had settled on the rivers in the jungle mehals before the appearance of Vira, and that Vira preached to men who had already been inaugurated into the mysteries of the Jain faith. The tradition of the Bhumij and their kindred tribe, the Ho or Lurka Coles of Singbhoom, that the Srawakas

occupied this country first, shews that the Jains are a very ancient sect. Their antiquity has been doubted in consequence of the modern appearance of their known temples, but those I have been describing as existing in Maunbhoom, are doubtless of great antiquity. In the regions that I have shewn were at one time a great seat of this sect, some colonies still remain. In 1863 I halted at a place called Jumpra, 12 miles from Poorulea, and was visited by some villagers who struck me as having a very respectable and intelligent appearance. They called themselves Sarawaks, and they prided themselves on the fact that under our Government not one of their community had ever been convicted of a heinous crime. They are represented as having great scruples against taking life. They must not eat till they have seen the sun, and they venerate Parswanath. There are several colonies of the same people in Chota-Nagpore proper, but they have not been there for more than seven generations, and they all say they originally came from Pachete. Contrasted with the Moondah or Cole race, they are distinguished by their fairer complexions, regular features and a peculiarity of wearing the hair in a knob rather high on the back of the head. They are enterprising, and generally manage to combine trade with agricultural pursuits, doing business both as farmers and money-lenders. The train of "Mahabira" is represented as consisting of "Sadhs," Sramanas and others, and lastly of '*Srawaks*,' the laity and the most numerous class of all. The whole of the Jains are divided into "Yatis" and "Srawakas," clerical and lay, and as their *gochas* or family divisions include *Agurwals*, and *Oswals*, and Parswanath or Mount Samneya is revered by a numerous body of the wealthiest people in India. From Central India, thousands of these classes annually visit the hill, and their reverence for it is so great, that a pilgrim to the shrines must attend to no call of nature whilst his feet are on the mountain.

I must now turn to the antiquities of the Brahminical type which tradition ascribes, why I know not, to Vikramadit. The zemindar of one of the Maunbhoom jungle mehals, commonly called the Rajah of Patkome, claims to be a lineal descendant of some Vikramadit, and every third rajah of the line takes that name. The name of the present rajah is Sutrogonadyt, his father was Vikramadit, and his grandson will bear the same name, the son's name is Udayadit. It

is on the estate of the gentleman claiming such ancient lineage and noble ancestry that we find, on the banks of the Sobanrika river, near its confluence with the Kurkari, the remains of the ancient city of Dulmi. I was in hopes I should here find family annals that would have given some account of the ruins, but the rajah has none, and appears to have no reverence for the place. This makes one sceptical of his royal descent, and the probability is, that he is nothing more than a Hinduized Bhoomij. He calls himself a Kshetriya—an honour to which all the Jungle Mehal chiefs aspire, declaring either that they conquered the country from the 'Dasyas,' or were elected by them, or were miraculously produced amongst them. In regard to subjugation, the difficulty is, that their ancestor must, in each case, have done it single handed, as the chief is the only representative of the force used; but this difficulty the rajah of Patkome gets over by declaring that his race were specially created to rule, the Dasyas to be ruled.

The antiquities of Dulmi comprise the remains of an old fort, several large tanks, and the ruins of numerous temples dedicated to the worship of Siva and Parbutee, to the adoration of the Linga and other objects of Brahminical idolatry. Crossing to the left bank of the river, the first object that strikes you, is a colossal figure of Gunesh amidst a confused heap of cut stones. The poor fellow has tumbled off his pedestal and lost his legs in the fall. If he had had fair proportions, he would have stood 12 feet high, as his body measures six feet; but with such ridiculously short and thick legs as were assigned to him, he only stood 9 feet. His place was that of Janitor, and the heaps of stones near him, the remains of the river gate of the old city; and you can trace from it the remains of masonry walls that must have embraced a considerable area. A little hill overlooking the river near this place is covered with cut and carved stones, and occupying the place of honour in the foundation of what appears to have been the principal temples just here, is a Linga, 18 inches in diameter, protruding a foot and a half from the 'Argah' in which it is embedded. The Argah is circular and three feet in diameter. In a brick temple, near this shrine of Siva, there is a stand for an idol, but the idol, which it is said was an image of Vishnoo, has been removed. There were formerly, I am told, a great variety of sculptures at this place, but they are now scattered all over the country. The brick

temple is probably of more modern date than the stone buildings, as it is partly arched on the radiating principle. Near the river are two mounds formed of the debris of two or more fine temples. The altar piece of one was a ten-armed figure of Doorgah slaying the monster Mahisasoor. There are two groups of this subject, one greatly mutilated, the other in good preservation, the arms and weapons all perfect and sharp cut. There are here two elaborately carved door pieces of the entrance to the shrine. The ornamentation, cut in a very hard stone, is as sharp and clear as if it had but recently been turned out of the sculptor's hands. It is like the wooden carving of a picture frame, so minute and neat are the borders and scrolls. Near the other temple I found a large altar group representing, I believe, Kamadeva and his wife. They are represented seated lovingly side by side, and are in a good state of preservation.

Amongst the detached blocks were two figures having in alto-relievo the "Machowa" and "Cuchowa" Avatars of Vishnoo. The whole series of incarnations doubtless formed the chief external ornamentation of one of the temples. On a former occasion of visiting these ruins, I noticed here an image of Vishnoo *in propria persona*, with well-formed features, a highly decorated conical cap, jewelled, extensive ear-ornaments and a mannikin in his left hand; this image I did not observe on the last occasion. Not far from the temples is a stone image of a life-sized bull, Siva's Bull, which appears to have wandered from the shrine into the fields to graze. We next came to an extensive tank surrounded by a moat and ditch, but between the moat and the tank, there is a considerable space all round which was probably the site of houses, making this an entrenched *tank square*. In the centre of the tank there is a singular structure of stone, two small columns supporting a triple umbrella, from which the tank is called the "*Chatta pooker*." This indicates that the tank was dedicated to Indra, the king of heaven, as the trident on a post in most tanks shows that the blessing of Siva has been invoked on the work.

In the village of Dulmi we have a collection of sculptures that have been removed from the ruins. There is a group of Vishnoo and Lakshmi, a single figure of Vishnoo, a smaller bull, and various other images. An uncle of the Rajah, a venerable looking old man, lives at Dulmi, but, strange to say, he could give me no in-

formation about the antiquities of the place. The people, though to this day worshipping Kalee and offering sacrifices to a clay image of her in a shed, utterly disregard the ancient shrines, and care not for the desecration or deportation of the idol. It is the same with similar remains of Brahminical worship all over the country. We see that it was established in places that are now the haunts of wild beasts or the abode of a race that know nothing of such worship, and we see by the destruction of the temples and mutilation of the images that equal zeal was displayed in uprooting, as in establishing, it. The destructive agency is generally supposed to have been put in action by the Mahomedan power, but I do not understand, if this were so, how it is that some tradition regarding the destruction is not retained. We may associate some of these temples with the hermits, rishis or sages of the ancient days of Aryan progress;—attempts made to establish religious colonies amongst the yet unsubdued aborigines. It would appear that even in the days of the Ramayun the aborigines of this part of the country were called Kols. In the Ramayun they are alluded to as fierce savages in a conversation between Seeta and her mother-in-law, wherein the latter enumerates the various difficulties Seeta would have to encounter if she accompanied Ram in his progress south.* ‘The Ramayun,’ says Lassen, ‘contains the narrative of the first attempts of the Aryans to extend themselves to the south by conquest, but it presupposes the peaceable extension of the Brahminical missions in the same direction as having taken place still earlier. Ram, when he arrives at the south of the Vindya range, finds there the sage Agastya by whom the southern regions had been rendered safe and accessible. The Rakshasas, who are represented as disturbing the sacrifices and devouring the priests, signify here, as often elsewhere, merely the savage tribes which placed themselves in hostile opposition to the Brahminical institutions.’† The Ramayun depicts the Dasyas as infesting the hermitages or settlements of the Aryans, as obstructing their sacred rites, as enemies of the Brahmins, &c. It is true we do not hear that in these early days the worship of Siva had been established, but the Hindoos of the Pooranic times were not less zealous in proselytizing, and may have followed the same system of pushing forward

* From Muir’s Sanskrit Texts, Part II. page 425.

† From the same, page 435.

religious settlements amongst the unsubdued Dasyas. This would account for the Brahminical ruins, mostly dedicated to the worship of Siva, scattered about the wild regions of this Province, some in picturesque secluded spots that a hermit would delight in, others in connection with fortified cities, all now deserted. We may conceive that these colonies, gradually assuming a more aggressive policy, were, after severe struggles, finally extirpated by the progenitors of the Kols, Bhoomi and Moondah of the present day; that the aborigines thus maintained their independence and their autonomy, but that from a feeling of lingering admiration for the superior intelligence, higher civilization and God-like beauty of the unsuccessful invaders, they retained some amongst them as their guides and instructors, and it may be, in some instances, from the remnant thus retained, elected their chief. We might thus account for the Aryan features and Brahminical predilections of some of the chiefs whom we find ruling an alien people without any evidence that they had by conquest attained that position.

The District of Maunbhoom is entirely composed of the estates formerly known as Jungle Mehals. The great proportion of the agricultural population are of the Bhoomij tribe who, as they speak the same language, have the same ceremonies, feasts and customs as the Moondahs of Chota-Nagpore and also intermarry with them, are, without doubt, of the same origin. Though in many places partially Hindooized, they retain the great festivals of their race, when both sexes join in the feast and the dance. The chiefs, who, as I have stated, all aspire to be Kshetriyas, have each his tradition regarding his accession to power. These are generally fables devised by the Brahmins, and they may thank me for having given them a method of claiming an Aryan descent without having recourse to them.

The Rajah of Pachete is lord of half the district, and several petty rajahs with whom separate settlements were made, formerly acknowledged him as Suzerain. These petty rajahs and others, called Jagheerdars, claim to be the descendants of the chiefs of the confederacy who made the first Rajah of Pachete. The fable framed for this family is that a noble lady of the Kshetriya race, on her way from Daranugger to Juggernath, was delivered of a male child under a hill near Jhaldah, which, it appears, she incontinently abandoned and proceeded on her way. The child was found by the people protected by,

and deriving nourishment from, a cow. It was taken care of and eventually made Rajah of Sikurbhoom or Pachete, and the present Rajah is, I think, the 52nd in descent from this foundling.

A rock near the town of Pachete is pointed as the identical cow that nourished the Prince, and whenever a Rajah of Pachete dies, it drops a stone which rolls down the hill. A regular establishment is maintained for the worship of this cow.

Note on a Copper plate Inscription from Sambhalpur.—

By Bábu RÁJENDRÁLÁLA MITRA.

[Received 7th December, 1864.]

The subjoined is the translation of a copper plate inscription lately presented to the Society by Lieut. G. Bowie of the Police Corps. It records the gift of a village named Chullanḍaraka in the district of Tundaraka to certain learned Bráhmans of the Kausika gotra. The name of the donor was Srí Mahásudevarája. Who he was is not mentioned, nor is any regal title assigned to him, but the epithets used, show that he was a king or chief of some consequence. The patent alludes to a place named Sarabhapura, which the donor had conquered. It was probably the ancient name of Sambhalpur. Originally the document was inscribed on three tablets of copper, of which the last is not now forthcoming. Of the remaining plates, each of which measures $6\frac{1}{2}'' \times 3\frac{1}{3}''$ inches, the first is inscribed on one, and the second on both sides. The characters used are of the Narbadda type of the 7 century, very similar to that of the Seoni plates noticed by Prinsep (ante Vol. V. p. 726) but a few of the letters are peculiar, the most aberrant being the *kh*, *ñ*, *ṇ*, *t*, *bh* and *l*. The vowel mark for *o* in *mo* is curiously given with an *e* on top and a *u* at foot. The loss of the date, which probably had been given in the third plate, and the absence of the donor's genealogy, deprives the record of all historical interest.

Translation of a Tāmra Śāsana from Sambhalpur.

Greeting! Srí Mahásudevarája, whose two feet are bathed by the ocean of light shed from the topmost jewels on the crowns of valiant

chiefs coming from Sarabhapura,*—who has caused the parted hair of the wives of his enemies to be dishevelled,—who is the bestower of wealth, land and kine,—who is a staunch follower of Vishnu (Bhāgavata),—and who devoutly reflects on the feet of his parents,—to the householders of Chullandāraka which is situated in (the district of) Tundaraka, thus addresseth, “Be it known unto ye, that this village, which is to secure celestial pleasures for me, has been, for the period of the duration of that earth, whose impenetrable darkness is dispelled by the light of the sun, the moon and the stars, along with all its mines and resources, unencumbered by lawsuits and aboriginal claims,* and free of all taxation, for the promotion of the virtue of my parents and myself, as well as of the estate and of the royal race, with our consent, by water and this copper-plate patent, dedicated to Trisaha Sravidyā Bhāshkara Swāmī, Prabhākara Swāmī, Barbbari Swāmī, Bodha Swāmī, Datta Swāmī, Vishnu Swāmī, Phalgu Swāmī, Swāmikīrti Swāmī, and Sañkara Swāmī, all of the Kausika gotra. Knowing this, may you remain obedient to their orders, and, rendering them a due share of the produce, live in happiness and prosperity.” For future kings is this advice given. Those who know ancient religion best, declare that the maintenance of gifts (made by others) is more virtuous than beneficence. Hence the inclination of future generations can alone protect this land presented to Brāhman of pure lineage and high Vedic knowledge. Therefore this gift should be preserved by you. These verses of Vyāsa are here appropriate; “gold was the first born of Agni, Vaishnavas the son of Surya”—

First plate.

- (१) स्वस्तिशरभपुरादिक्रमोपनतसामन्तमुकुटचूडामणिप्रभाप्र-
- (२) सेकाम्बुधैतपादयुगलो रिपुविलासिनोसीमन्तोद्धरणहेतुर्वसु
- (३) वसुधागोप्रदः†परमभागवतो मातापितृपादानुध्यातश्चोमहासुदे
- (४) वराजः तुण्डरकभुक्तीयचुल्लण्डरके प्रतिवासिकुटुम्बिनस्त्र
- (५) माञ्जापयति विदितमस्तु वो यथायं ग्रामः त्रिदशपतिसदनसुख
- (६) प्रतिष्ठाकरो यावद्रविशशिताराकिरणप्रतिहतघोरान्धकारं ज

* The original is doubtful. The word used is, *avādabhaṭaprávedya*;—a “not” *vāda* “lawsuit” *ṭhaṭa* “barbarian” or “aborigines” and *právedya* “claims.”

† The *Upadhmāniya* is in the original, put on the top of the following letter.

Second plate, first side.

- (१) गदवतिष्ठते तावदुपभोग्यस्सनिधिस्सोपनिधिरवादभटप्रद्यवो
- (२) सर्व्वकरविसर्जितः राज्यमहावीरायकुलैः मातापित्रोरात्मनश्चपु
- (३) ण्याभिरुद्धये उदकपूर्व्वं* कोशिकसगोत्रत्रिसहस्रविद्यभास्करस्वामि
- (४) प्रभाकरस्वामिवर्ब्बरिस्वामिबोदस्वामिदत्तस्वामिविष्णुस्वामि
- (५) फल्गुस्वामिस्वामिकीर्त्तिस्वामिशङ्करस्वामिनां ता†शासनेवातिष्ठ
- (६) यो भूत्वास्माभिरनुमोदितः ते यूयमेवमुपलभ्यैषामाज्ञा श्रव

Second plate, second side.

- (१) णविधेया भूत्वा यथोचितभोगभागमुपनयन्तः सुखं प्रतिवक्ष्यथ
- (२) भविष्यतश्च भूमिपाननुदर्शयति दानाद्विशिष्टमनुपालनजं पु
- (३) राणे धर्म्मं सुनिश्चितधियः प्रवदन्ति धर्म्मं तस्मै द्विजाय सुवि
- (४) शुद्धकुलश्रुताय दत्तां भुवं भवभुवो मतिरेव गोप्तुः तद्भवद्भि
- (५) रण्येषा दत्तिरनुपालयितव्या व्यासगीतांश्चात्र श्लोकानुदाहर-
- (६) न्ति अग्रेरपत्यं प्रथमं सुवर्ष्मं भूद्वैष्णवं सूर्य्यसुता

LITERARY INTELLIGENCE.

Kavi Harichand Kunje of Bombay has lately brought out an edition of the *Saṅkshepa Saṅkarajaya* of Mādhava Āchārya with a commentary by Dhanapati Sūrī, entitled "The Dimḍima." The text is in verse and contains, in 16 cantos, a poetical account of the life of Saṅkara Āchārya. The first canto gives an introduction; the 2nd, an account of the birth of Saṅkara; the 3rd, a conversation of the gods with S'iva in which the latter promises to appear in flesh as Saṅkara; the 4th, a description of the boyhood of Saṅkara; the 5th, his assumption of asceticism or Saṅnyāsa; the 6th, the extent of his learning; the 7th, an account of the Vedānta Darsana; the 8th and the 9th, the polemics of Saṅkara with Maṇḍana Miśra and his wife Saraswatī; the 10th narrates a story about the life of Saṅkara entering the dead body of a king in order to enjoy the society of his wife; the 11th contains the substance of his disputations with Ugra Bhairava; the 12th, an account of his taking Hastāmalaka and others as his disciples; the 13th, his teaching of the Ve-

* Probably a misincision for को.

† ताच recte.

danta system of philosophy; the 14th, his conversation with Padmapáda, on pilgrimage; the 15th, his disputations with all the great scholars of India; and the 16th, his last illness, his travels in Kashmir, Badarikárama, Kedára and elsewhere, his disputations and teachings there, and his final departure from the earth. Although it does not give so good an account of the different sects prevalent in India during the time of Sañkara and of their dogmas, as the prose work of Anantánandagiri now being printed in the new series of the Bibliotheca Indica, it was largely used by the late Professor Wilson in compiling his "Religious Sects of the Hindus." The work is tolerably well printed, but, like most works issued from the native press, it is not edited.

Parasuráma Purka of the same city has published a short treatise by Ananda Swámí, entitled *S'áiva Sudhákara*. It is a manual on the worship of S'iva. A similar manual on the worship of Vishnu and named *Náráyana Sára Sangraha*, has been published by one Shatari Dása, a Gour Brahman of Bombay. Both are lithographed in the *puthi* form and comprise 50 and 32 folia respectively.

Professor Weber of Berlin has sent to press an essay on the *Bhagavati Sutra* of the Jains, in the introduction to which he has given an elaborate dissertation on the Mágadhi of that curious work.

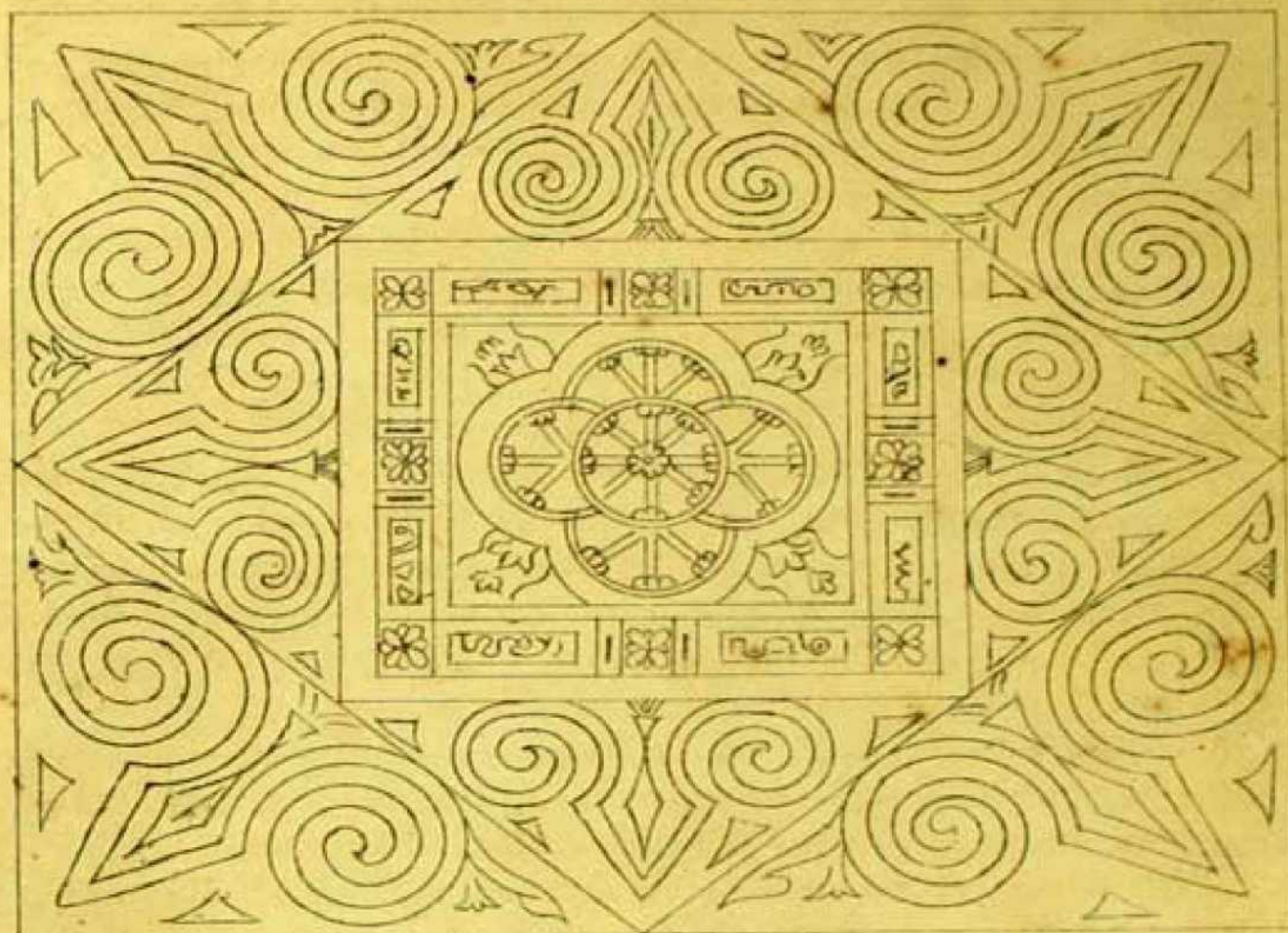
The following is an extract from a letter, dated 13th September, 1865, from Professor Holmboe of Christiania, containing notices of two interesting papers published by him in the *Saerskilt Aftrykt af Vid. Selskab Forhandlinger* for 1864.

"On yellow and red earth in ancient barrows. J'y ai démontré, que dans des tertres sépulcrales de Scandinavie on a trouvé quelquefois des quantités de terre jaune ou rouge, partie dans des vases, partie hors d'eux. J'y ai comparé la trouvaille de minium (sindur) dans quelques topes de l' Afghánistán; et hasardé la conjecture, qu' on a voulu honorer les défunts par l'insertion de la couleur, jaune ou rouge—les couleurs solennelles des religieux Bouddhistes; comme aussi le samghati de Bouddha selon la légende était rouge.

2. Sur une suite d'anciens poids trouvés dans un tombeau on voit, que dans une partie de Norvège, comme en Suède on subdivisait l'Ortug en huit parties (Peningar), justement comme en Inde on subdivisait le Kurho ou Tola (égal á l' Ortug de Scandinavie) en huit parties."

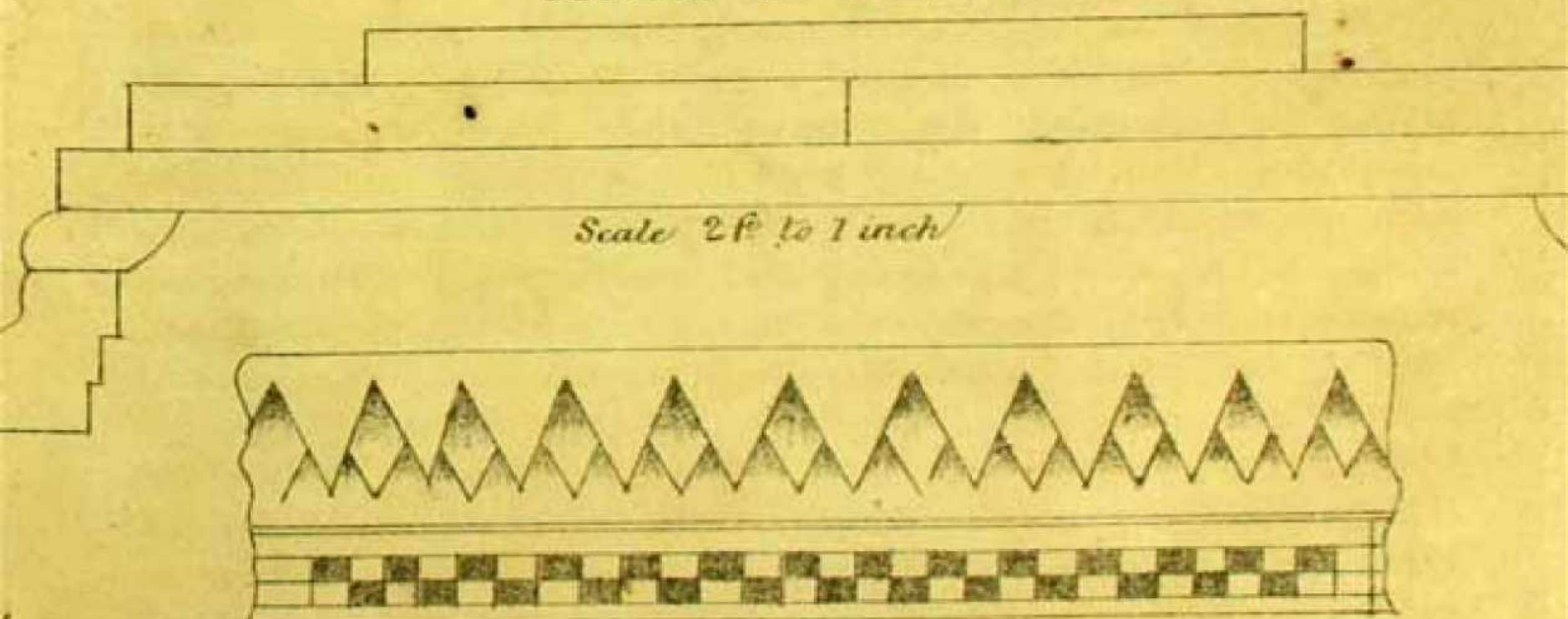
BUDDHIST VIHAR-RAJ GHAUT FORT.

CEILING



Scale 2 ft to 1 inch

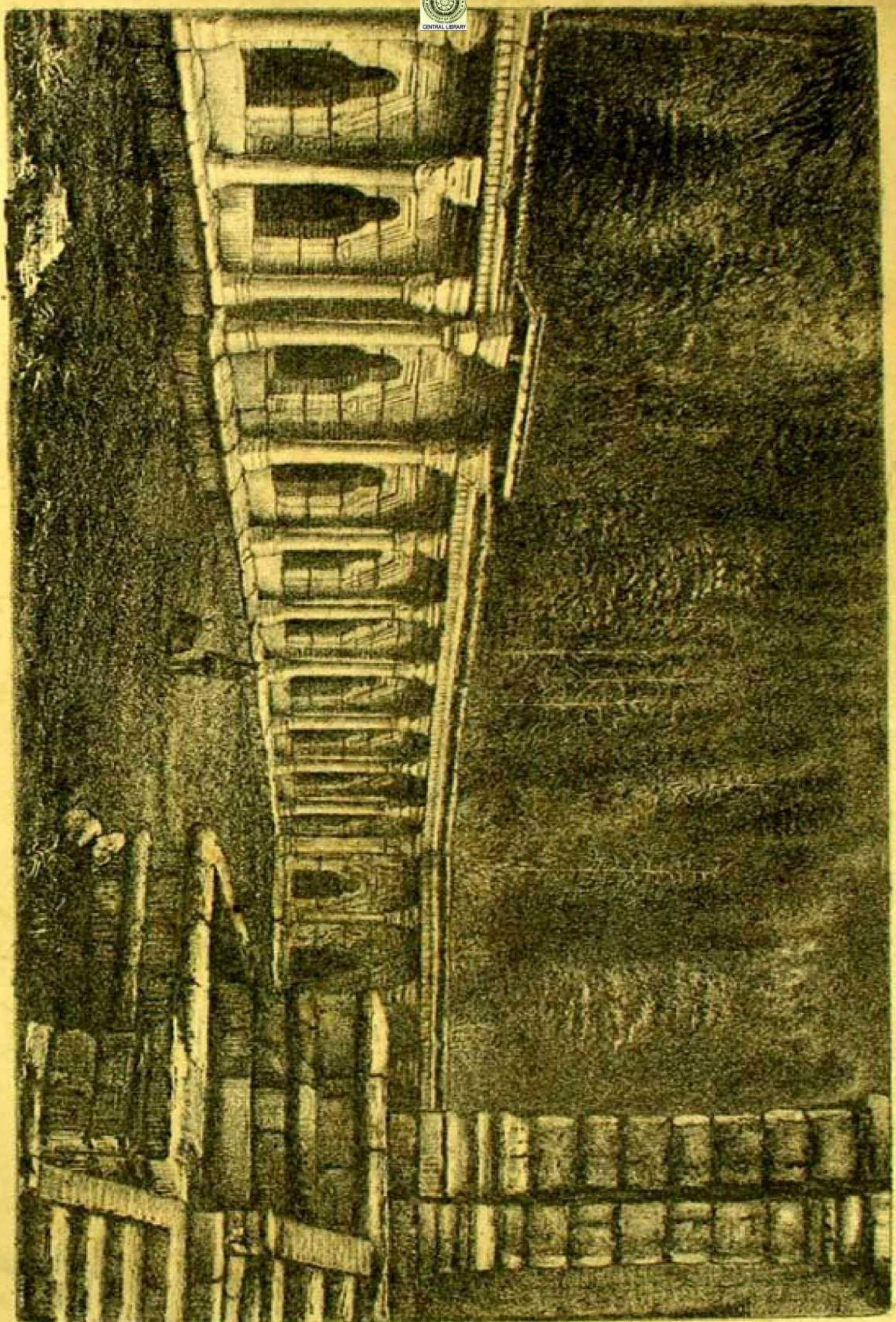
SECTION OF CEILING.



Scale 2 ft to 1 inch

Scale 1 inch to 1 ft

SECTION OF ROOF SLAB
showing side ornamentation.



COLONNADE AT BHANIPUR

JOURNAL OF THE ASIATIC SOCIETY.

PART I.—HISTORY, LITERATURE, &c.

No. IV.—1866.

Notes on the History and Topography of the Ancient Cities of Delhi.

By C. J. CAMPBELL, Esq., C. E.

Received 11th August, 1866.

Save a brief notice in Fergusson's Hand-Book of Architecture, the only reliable information that we possess regarding the ancient cities of Delhi, is to be found in the valuable contributions of Colonel Lewis, Mr. Cope, and General Cunningham to the Journal of the Asiatic Society.

My object in writing down the following notes has been, to supplement their descriptions by such additional information as I have been able to collect during a residence of more than six years in Delhi, in which I have been favoured with more than ordinary opportunities for studying the subject. I shall commence with the Musjid Kutb-ul-Islam which, from its age and from the circumstances connected with its construction, is by far the most interesting building in Delhi. In describing it, General Cunningham has fallen into a slight error; he attributes the whole of the additions, save only the Alái Durwáza, to Shamsh-u-din Altamsh; whereas we know from history, that that monarch only constructed a small portion of them, the grand extension towards the east having been erected by Ala-u-din in the beginning of the 14th century.

The portions built by these kings, as also the original work of Kutb-ud-din Eibeg, can still be distinctly traced, and I shall now proceed

to describe them in detail: first premising that there are certain portions which have been disarranged, or have otherwise suffered, during the restorations effected at various times; and the evidence of which must therefore be received with caution. These are: first, the colonnade and back wall between *a* and *b* (see Plate XXII.) which, with a strange want of discrimination, were reconstructed* by Major R. Smith from materials which had originally formed portion of the colonnade at H;—secondly, the windows in Kutb-ud-din's work, few of which escaped re-arrangement at the same time,—and, thirdly, the central grand Arch where Captain Wickham has inserted an impost for which the adjoining one afforded no warrant.

Let us commence with the pillars in the colonnades. In Kutb-ud-din's work† these are of *red and yellow sandstone*, as are also the lintels and domed roofs over them: they differ in height, in thickness, in the number of parts of which they are composed, and in the ornamentation with which they are covered, whilst the spaces between each pillar differ throughout varying between $5\frac{1}{4}$ feet, $8\frac{1}{4}$ feet, and every imaginable intermediate number; thus proving that they are the remains of older buildings worked up into a new design.

In the colonnades at E, F, and H, (Altamsh's work,) the pillars‡ are of *granite* neatly carved:—they also are of different lengths, and the spaces between vary like the last, ranging between $5\frac{3}{4}$ and 8 feet. They are much weathered and discoloured, which marks their antiquity, the whole proving that they too are old materials worked up again, but that they are not from the same source as those in Kutb-ud-din's work. In the colonnade at F, G, the pillars§ are also of granite, but clean and sharp as though fresh from the mason's chisel: they are plainly carved, are uniform in size, and are spaced at an equal distance apart of $8\frac{1}{2}$ feet.|| This shews that they were made expressly for the work in which they now stand.

* Major Smith in his report admits that he re-arranged this colonnade, and the most superficial examination will serve to shew that the pillars belonged to Altamsh's work.

This is confirmed by the statement of one Siwa Ram (now deceased) who, as head mason of Government works at Delhi for nearly forty years, had much to do with these restorations; and who assured me that this was the case.

† See figs. 1 to 4, plate XXIII.

‡ See fig. 8, plate XXIII.

§ See fig. 9, plate XXIII.

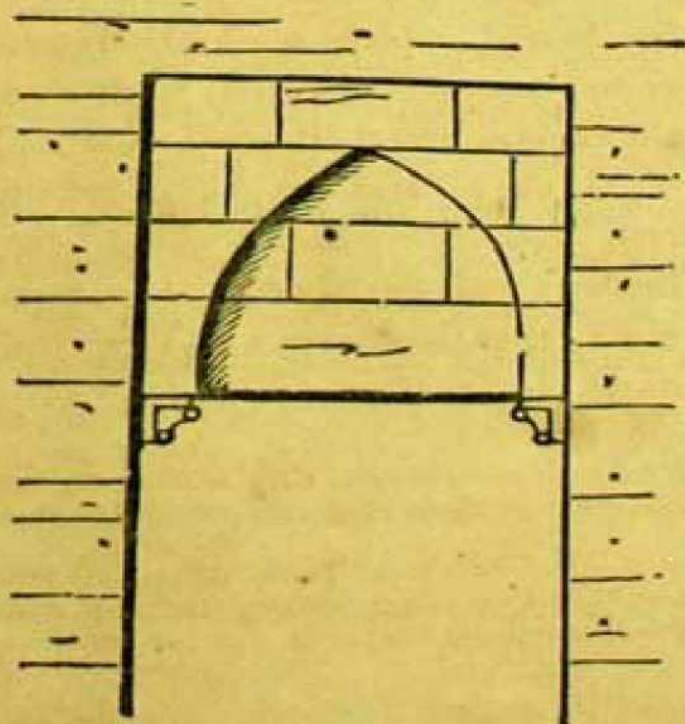
|| Some are $8\frac{1}{4}$ feet only.

Next as regards the enclosure walls. At B, the original angle of Kutb-ud-din's mosque is plainly discernible, and there is so great a difference in the style and quality of the masonry, that we can easily see that the north wing is a later addition.

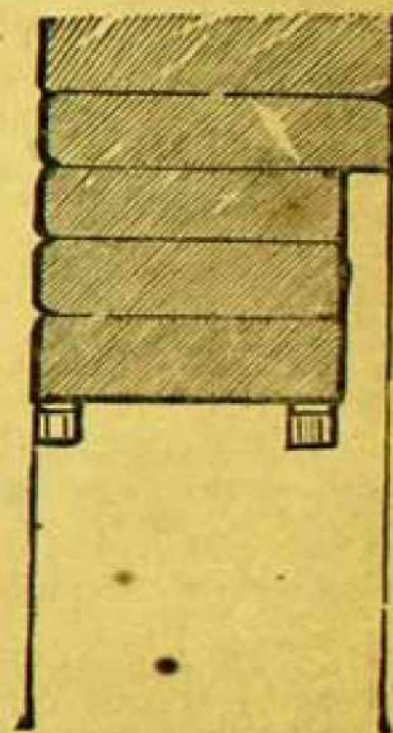
It is also evident that this latter is of the same date as the wall between E and F, a comparison of which with the wall between F and G, shews the following marked differences. In the first the stones are discoloured and weathered,—the remains of some older building—and a plain string course runs along the wall just below the springing level of the window arches:—in the second, the stones are clean, sharp and grey, evidently cut new for the work, and the string course is omitted: the junction of the two styles at F is clearly distinguishable. But the difference of style is most distinctly marked in the windows; those in E, F, are covered with lintels resting on corbels, a false horizontal arch being recessed on the outer face: those in F, G, have regular arches, with true voussoirs, running through the whole thickness of the wall.

Sketch of Windows in E, F.

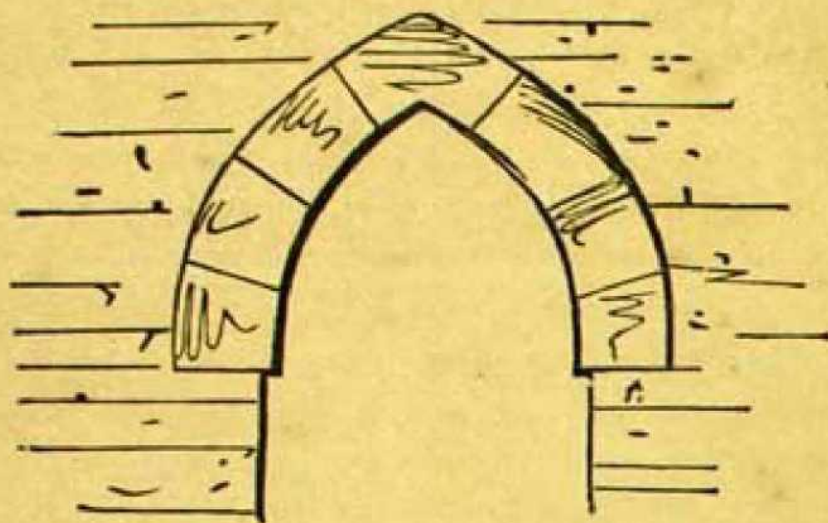
Elevation.



Section.



Sketch of Windows in F, G.



The absence of voussoirs proves that the former dates from the early part of the 13th century ; whilst the date of the latter is determined by the red sandstone gratings fixed in the windows, which are identical in style with those in the Alái Durwáza ; into the walls of which at F, G, they have been carefully bonded from the very first, the whole forming one work, the date of which is fixed by the inscriptions on the gateway.

Lastly, the great arches are quite different in style,* the piers in the central portion are square on plan, they have no niches in them, and the jambs are left uncut ; the arches have no impost† and are slightly ogee in the head ; and the ornamentation is simple, monotonous, and decidedly Hindu in character.

The side arches are on a lower level than the central ones ; the piers have arched niches ; and their jambs are cut into octagons and ballusters : the arch springs from a cap to one of these latter, which does duty as an impost, and it is pointed in the head and not ogee, whilst the ornament is later in date and more elaborate. (Fig. 6 and 7.)

All these peculiarities are repeated in Altamsh's tomb, and we are thus enabled to fix the date of its construction. It must have been erected by the same builders and at the same time as the north and south wings of the mosque, *i. e.* in the king's own lifetime, and not

* See Fig. 5, plate XXIII.

† As I have said before, the impost to the centremost is an addition of Captain Wickham's. It should be removed.

during the reigns of his two immediate successors, as has been surmised by some writers, who forget how short and troubled was the rule both of Rukn-ud-din Firuz and of his sister Razia Begum.

We are thus still able to trace the work of each of the three builders of the great mosque. The original building of Kutb-ud-din is shaded with detached lines on the annexed plan (Plate XXII.) : it was an oblong enclosure, $142\frac{1}{2}$ feet by $108\frac{1}{2}$ feet inside dimensions, with the famous iron pillar towards its west end ; behind which, and immediately in front of the western colonnade, towered five gigantic arches. These were a mere mask, carrying no roof, that of the chamber behind being at the same level as the other portions of the colonnade ; as may be seen from the few remains of it which still exist. Shamsh-ud-din Altamsh, some years later, added the north and south wings (shaded with dots on plan), thus converting it into a triple mosque.

These wings were similar in design to the central portion ; a mask of three large arches in front of a pillared chamber, with a colonnade enclosing an open space 353 feet broad, but only 200 feet deep, the eastern wall having run along the line *d, d, d*. Not a trace of this is now to be seen ; but the back columns at H shew signs of having been formerly built into it, and this, with other features, tends to prove that these pillars are standing "in situ."

In A. D. 1310, Alaudin commenced his grand extension (shaded with long lines on plan) which, if completed, would have made the inner enclosure 355 feet broad and 372 feet deep. He built the superb Alai Durwāza as a grand entrance from the city side ; and to the north, near his palace in Siri, began a second and greater minar. General Cunningham is of opinion that this latter was stopped in 1312 ; this was probably the case, and it may with safety be surmised that, like the minar, the mosque was never completed.

Before quitting the subject, the difference of style between Ala-ud-din's work and that of Kutb-ud-din and Altamsh requires a slight notice. We know from Ferishta, that the former monarch had a large body of skilled artificers attached to his household, for whom he found constant employment ; and these must have been well trained in the principles of Saracenic architecture and construction ; for there is no very noticeable difference between their work and that of contemporary builders in other Mahommedan countries. But with the two

first Pathan kings it was different ; and there is a strange mingling of Saracenic design with Hindu construction, that is not a little curious. Thus, the idea of the Kutb Minar is borrowed from those still standing on the plain of Ghazni :—the great arches were of Mahomedan design, and so too was the square massive tomb of Altamsh. The details of the ornamentation are also more decidedly Saracenic than is generally supposed ; thus the curious battlements over the second and third doorways in the minar are almost exact copies of those in the mosque of Kalaon at Cairo, (built A. D. 1284), whilst the honey-comb work under the balconies of the same structure, differs in no perceptible degree from that in the Alhambra at Granada. But, side by side with much that is purely Saracenic, we find many details that are indisputably Hindu in character, as, for instance, the bell and chaplet ornament ; the wheel roses ; the lozenge inside an oblong pannel ; and the scroll tracery on Kutb-ud-din's arches ; whilst the arches are all *horizontal* and of purely Hindu construction.

The explanation of this phenomenon is a simple one :—the early Mahomedan settlers were rude soldiers, too much occupied with hard fighting to settle down into artizans ; their leaders might find leisure to plan and design, but for the actual execution of their projects they were compelled to depend upon the conquered people, who, in carrying out their orders, introduced many of those details with which the practice of centuries had familiarised them.

KUTB MINAR.

General Cunningham has written so fully and carefully on the subject of the Mahomedan origin of this column, that a few brief notes are all that need be added here. That Kutb-ud-din designed and commenced it, is generally considered to be proved by the occurrence in the lower story of Mahammad Ghorî's name, (shewing that it was begun in his lifetime, and therefore in that of Kutb-ud-din) ; and also from its bearing the name of this latter monarch. Its position with regard to Kutb-ud-din and Altamsh's work, may be adduced in favour of this view.

It stands symmetrically enough as regards the former, opposite to and just outside the south-east corner, but with the colonnades of Altamsh it fits in altogether awry, standing just 11 feet *outside* the

south one, and about 8 feet *inside* the east one. Had Altamsh designed it, he would surely have placed it more symmetrically. As it now stands, it is evident that the position of his colonnades was regulated by some considerations* which we cannot now determine, and that the Minar, which was already in existence, had to fit in with them as best it might.

As regards the age of the various portions as they now stand, the most superficial examination will shew that the three lower stories, whilst they are identical in style and construction with the work of Altamsh, differ completely in both particulars from the two uppermost ones. In the former, except the outer casing which is of sandstone (no marble being used anywhere), the walls are of cut granite; so too are the central pillar and the steps, which latter are not plain lintel blocks, but are carried upon corbels projecting from the walls. All the doorways and openings have Hindu horizontal arches; the sandstone is old and discoloured, and the ornamentation dates from Altamsh and Kutb-ud-din's time. In the two upper stories all is changed; the walls, steps and central pillar are of bright red sandstone, white marble being introduced into the outer face, the steps have no corbels, the arches have true voussoirs, and the ornamentation is identical with what we find prevalent in the latter half of the 14th century. We are thus warranted in assuming that these two stories were *newly designed* and built by Firuz Shah in A. D. 1368.

General Cunningham agrees as far as the fifth story is concerned, but thinks the fourth is original, as the inscription over the doorway dates from the reign of Altamsh. But this doorway is exactly similar to the one above; it is built of similar stone, is of a similar shape, and, like it, has true voussoirs; it is clear therefore that the old tablet of Altamsh has been simply re-built into the new work of Firuz Shah.

As regards the work executed in A. D. 1503, by Sikandar Shah Lodi, I can find no traces of it; and presume therefore that it consisted of *bonâ fide* repairs, such as those undertaken by the British Government forty years ago.

* Probably owing to the nature of the site, which falls rapidly to the south-east from about the point marked E on the plan.

LALKOTE.

General Cunningham has endeavoured to identify the grey granite walls of the large citadel that lies around the Kutb mosque and minar with the Lalkote, or "Red fort," constructed by Anang Pāl in A. D. 1060. Now, as he himself admits, no Mahommedan writer alludes to any *citadel** of that name, either when describing the capture of the city, or on any other subsequent occasion. On the contrary, Zia Barni speaks of the final assault as being made through the Ghazni gate of Rai Pithora's fort, which we know to have been a distinct place from Lalkote; and the possession of which evidently implied the capture of the whole city. Had Lalkote been a strong citadel, as Cunningham supposes, a subsequent attack upon it would doubtless have been necessary, in order to secure quiet possession of the place, and this second assault would have been recorded in history.

We know that the palace in which Rai Pithora resided, when the city was captured, stood upon the site of the Kutb-ul Islam mosque, to make room for which it was removed. I am decidedly of opinion that *this* was the building known among the Hindus as Lalkote, and that only on this supposition can the total disappearance of the name from history be explained. The work of Anang Pāl would thus be but a small one, containing probably the one temple built by that monarch and the famous Iron Lath; and it would derive its name, like the Lall Mahal and Ruby Palaces of a later date, from the red sandstone of which it was built, and which was afterwards worked up into the great arches, the Kutb Minar, and the tomb of Altamsh.

SIRI AND THE SITE OF ĀLA-U-DIN'S ENTRÉCHMENT.

I now pass to the consideration of General Cunningham's arguments in favour of identifying Siri and the site of Ala-u-din's entrenchment with the ruined city of Shahpoor, and his rejection of the theory, upheld by Lewis, Cope and Burgess, that the first of these was merely the name of the citadel around the Kutb.

Neither Ferishta nor any other writer makes mention of Shahpoor. As regards the origin of the other three places, we learn: first, that

* The prohibition against beating kettle drums in Lalkote mentioned by General Cunningham is merely a regulation of the *palace* in which Kutb-ud-din took up his first abode.

Ala-u-din built a fort, or city, called Siri: secondly, that he rebuilt the walls of the ancient citadel of Delhi; and, thirdly, that he built a palace* on the spot where he intrenched himself during the Mogul invasion of A. D. 1303.

There is much that is plausible in General Cunningham's arguments, but a little consideration reveals their weakness, which, indeed, appears at times on the very surface, as, for instance, where he admits (page lxix.) that the present walls of the Kutb citadel were rebuilt by Ala-u-din, although he has already described them as the work of Anang Pâl:—and again, at page lxviii., where he confounds the palace built on the site of Ala-u-din's entrenchment with the famous Kasr Hazâr Situn; forgetting that this latter was commenced by Nasir-u-din Mahmud, and completed by Ghaias-u-din Balban at least fifty years before the Mogul invasion.†

Let us first endeavour to ascertain, from their style and characteristics, the age of the present ruins of Shahpooor and of the Kutb citadel. The walls of the latter are very strong and massive; the curtain is flanked by towers placed at short intervals; the ditch is deep and broad; the main gates are judiciously set in the re-entrant angles of the bastions; strong outworks are thrown up at the weak points of the defences;—all this marks a late date, when the science of fortification was well matured and thoroughly understood. This view is confirmed by the existence of an arch with true voussoirs in a barbican at the north-west angle, the shape of which is exactly similar to those generally used by Ala-u-din. It forms an integral portion of the wall in which it occurs, and has evidently been there from the first; whilst the style of the masonry, and the manner in which it is bonded in with the main wall, shew distinctly that the barbican is of the same date as the rest of the walls, and we have thus proof positive that these, as they now stand, are the work of Ala-u-din and not of Anang Pâl.

At Shahpooor then are the remains of a palace and city wall of no great size or strength. The style of these, as shewn in the shape of the arches, walls and domes, is that of the end of the fourteenth or begin-

* Be it observed that this is always spoken of as a *palace*, and not as a city or fort.

† In the *Ayin Akhberi* a palace of this name is said to have been built by Mahommed Togluck, but I believe this to be a mistake.

ning of the fifteenth century; and no earlier date can with safety be assigned to them. This confirms the traditional report which assigns their construction to the Sultan Bhailod Lodi, who ascended the throne A. D. 1450, and whose remains are interred close by; and we are warranted in asserting that Shahpore was not in existence until 150 years after the Mogul invasion, and thus General Cunningham's identification of it with Ala-u-din's palace and entrenchment of A. D. 1303 falls at once to the ground.

Let us next enquire, what remains still exist of that monarch's numerous buildings. Of these there are two distinct groups, and two only: first, the walls of the Kutb citadel, and the mosque, minar and palace within it; and, secondly, the mosque near Nizam-u-din Aulia's tomb, with the palace adjoining it, the remains of which are now known as the "Lall Mahal."* The first of these palaces cannot possibly be the site of Ala-u-din's entrenchment, for we know that this was on the open plain beyond the suburbs of Delhi. In order to ascertain whether the last fulfils any better the requirement of the case, let us examine carefully the history of Turghai Khan's invasion.

We are told that the Mogul Chief was induced to invade India by learning of the absence from the capital of two large armies which, as events shew, constituted the whole strength of Ala-u-din's forces. One of these, under the king himself, was besieging Chittore: the other, with which was the bulk of the Cavalry, was absent in Bengal; hearing of the Mogul invasion, the king hastily returned with the former, and proceeded to entrench himself, until succour could arrive from Bengal and the other provinces.

These succours could only reach him from the Doab, across the river Jumna; for to the north lay the Mogul army: to the west and south-west were the Mewaties, then, as always, a turbulent and disloyal race; to the south lay the dense jungle and forest through which, 200 years later, Shir Shah cut the great imperial road between Delhi and Agra. It thus became a matter of vital import, that Ala-u-din should hold in strength the principal crossing of the river. Owing to the range of Hills which lies to the east of the city, this crossing can only have been at one of two points; either through the gap at Togluckabad, or somewhere near Ghaiaspore. The

* For a description of this, see Note A.

first of these must even then have been a swamp, and 20 years later was converted into a lake by Toghluck Shah; the presumption is therefore in favour of the latter site; and this presumption is strengthened by the fact of the suburbs having grown in this direction, (they would naturally creep along the principal road leading from the city :) whilst the old lines of road across the river seem to have led towards this part of its course. I conclude therefore that Ala-u-din would naturally entrench himself at this point, covering not only the fords of the Jumna, but also the towns and palaces of Ghaiaspoor and Kilukheree; whilst he would throw a strong body of troops into the old walled city and its citadel, so as to render them safe against a sudden attack.

If such were his position, we can understand the otherwise unaccountable apathy of the Moguls who, for two months, lay encamped opposite to his entrenchment without venturing to attack it, or to besiege the city. Had they attempted either course, they would have exposed themselves to an attack in the rear; and so they could effect nothing save a few marauding expeditions into the district about and against the unwall'd suburbs, until the approach of succour and (as is conjectured) the sudden assassination of their leaders by the emissaries of Nizam-u-din Aulia forced them to decamp. If Ala-u-din had entrenched himself, as Cunningham supposes, at Shahpoor, he would have been shut up as in a trap, cut off from all succour and unable to prevent the enemy from besieging both the city and his own position; although he could easily have saved Jahanpanah from being plundered by them; and as we learn from Ferishta that he was *not* able to check their foray, we must presume that it was because his position was some distance away:—in fact at Ghaiaspoor. I conclude therefore that in the Lall Mahal we have the remains of the palace built to commemorate the repulse* of the Moguls in A. D. 1303.

Let us now endeavour to ascertain to what place the name of Siri must be assigned. We must bear in mind that Shahpoor was

* May this not be the reason why Nizam-ud-din Aulia lies buried close to this palace? The flight of the Moguls was universally ascribed to the exercise of his supernatural powers, and what more likely than that the buried him here as being the scene of his supposed victory?

probably not built until the middle of the fifteenth century; that the walls of the Kutb citadel were rebuilt by Ala-u-din; and that there are no remains whatsoever of any other citadel or strong fort built by him.

The most prominent references in history to the fort of Siri are those connected with the troublous times which preceded and followed the invasion of Timur. In them it is always spoken of as a place of great strength, as the citadel of Delhi in fact. Thus Mallu-Khan* by its possession kept in awe the conflicting parties of Mahmud Togluck and Nasrat Shah;—twice† it withstood successfully all the forces that Khizr Khan could bring against it; and it was only taken by him after a third siege which lasted for four months: whilst thirty years later it was again besieged for three months without success. These facts, it need hardly be said, point rather to the Kutb citadel than to Shahpoor; for the former is a work of great natural and artificial strength; whereas the latter is a weak place, which had for defences a slight wall without any ditch, and which was commanded by the Brij Mandil and other lofty buildings in the adjacent Jahanpanah. In fact the history of this period can only be made intelligible on the supposition that the Siri held by Mallu Khan was the Kutb citadel; that Mahmud Togluck held the old city of Rai Pithora and Jahanpanah; whilst Firuzabad was occupied by Nasrat Shah; and we have then no reason to call in question the truth of Ferishta's statement regarding the meeting of Mallu Khan and Nasrat Shah at the grave of Khawaj Kutb-u-din Bakhtiar Kaki, a statement which completely identifies Siri with the Kutb citadel, within which the tomb of this famous saint may be seen to this very day.

General Cunningham endeavours to dispose of this very direct piece of evidence, by asserting that Ferishta knew nothing of the topography of Delhi; and he suggests that he was probably mistaken, and that the meeting in question took place at the tomb of another saint; one Shaikh Nasir-u-din Mahammad (better known as Roshun Chiragh Delhi) "which is just outside the south-east corner of Shahpoor." Now unfortunately for this emendation, this latter tomb is situated *within the walls of Jahanpanah and was in the possession of Mahmud Togluck*. It could not possibly therefore be the place where

* A. D. 1394—1396.

† A. D. 1411—1414.

his two enemies met publicly to swear a solemn league against him. As for Ferishta's knowledge of Delhi, a glance at his preface, and at the life prefixed to Briggs's translation of his history, will suffice to shew that the first portion of his great work (with which alone we are concerned at present) was composed before he had ever seen the city. He commenced to write in A. D. 1596, finishing the whole work in A. D. 1609 : and, if he ever visited Delhi at all, it must have been in A. D. 1606, when proceeding on his embassy to Jahangir's camp at Lahore. But as his history was compiled from no less than fifty-five chronicles, the writers of many of which lived in Delhi and were eye-witnesses of what they wrote about, it is in point of fact their topography, and not his, that we have to do with, and we may accept it as thoroughly reliable in a simple matter like the one under discussion. I see no reason to doubt therefore that Siri was the name of the Kutb citadel :—and judging from the date of its appearance in history, I think we may fairly assume that the name was first given it by Ala-u-din when he rebuilt and strengthened it in A. D. 1304.

I now come to General Cunningham's* quotation from the *Ayin Akhberi*, to the effect that "Shir Shah destroyed the city of Ala-u-din which was called Siri, and founded another :" to which Syud Ahmad has added, on whose authority is not stated, that the materials of the former were used in the construction of the latter city. Now without for one moment impugning the accuracy of the General's translation and subsequent deductions, I must call attention to the notorious discrepancies which exist in the various copies of the *Ayin Akhberi*. In the one† now lying before me, not a word is said about the destruction of Siri ; on the contrary it is Firuzabad‡ and its palaces which are said to have been demolished by Shir Shah. This is a much more probable statement than the one in General Cunningham's copy, and borrows strength from an argument adduced by him against the likelihood of Shir Shah's bringing his building material all the way from the Kutb citadel, when Shahpoor was only three and a half miles away. Now as Firuzabad lay still nearer, occupying indeed a portion of

* Page lxviii.

† A handsome quarto belonging to the "Delhi Society" (vernacular) and presented to that body by Colonel G. W. Hamilton, Commissioner of Delhi, whose fine collection of Persian MSS. is well known.

‡ See extract at the end : note B.

This exhausts all the evidence at present available on the subject, and a calm consideration of it forces us to the conclusion that the Kutb citadel is the fort of Siri;—that Shahpore is a modern place of no importance; that Lalkote has long since been swept off the face of the earth; and that the Lall Mahal marks the site of Ala-u-din's entrenchment in A. D. 1303.

THE VARIOUS CITIES OF DELHI.

I shall conclude with a few brief notes on the rise and duration of each of the ancient cities, shewing which of them were contemporaneous; and we shall thus get a clear idea of what that very indefinite word DELHI meant at various epochs in its history.

The Delhi of the Hindus and early Pathan Kings (A. D. 1060 to 1250) comprised only the walled city, now known as Rai Pithora's, and its citadel: which latter, when rebuilt by Ala-u-din, received the name of Siri.

A. D. 1250 to 1321.—By the end of the 13th century a large suburb had grown up outside the walls, stretching along the road to Ghaiaspoor and Kilukheree, near which the great main road to the east and south-east crossed the river Jumna. At these two places, country palaces had been erected by Ghaias-u-din Balban, Kaikobad, and Jalal-u-din; around which a new city was gradually springing up.

A. D. 1321 to 1354.—During the reigns of the two first kings of the house of Togluck, the city of Togluckabad and the fort of Mahommadabad (or Adilabad) were erected; and the suburbs above referred to were enclosed with a wall, receiving the name of Jahanpanah. Togluckabad was never a populous place, and seems to have been quickly abandoned. The insane removal of its inhabitants to Daulatabad would have much to do with this; but the finishing blow was probably given in A. D. 1354, when Firuz Shah removed the seat of government to his new city of Firuzabad, which he had just completed.

A. D. 1354 to 1398.—Delhi was now at the zenith of its greatness and contained larger population and more wealth than at any other period of its history; but the invasion of Timur was a death-blow to its prosperity and it sank rapidly from this time.

A. D. 1398 to 1450.—Both the old city and Firuzabad gradually declined; whilst the new city around Ghaiaspoor increased in size and importance; and in the neighbourhood of this latter the Syud kings took up their abode, building the forts of Khizrabad and Mubarikabad.

A. D. 1450 to 1530.—The old city had a slight gleam of prosperity under Bhailol Lodi, who built the palace and fort of Shahpoor; but his successor removed the seat of government to Agra, which thenceforward shared with Delhi the honour of being the capital of India.

A. D. 1530 to 1638.—The next addition was made by Humaiun who commenced to build the fort now known as the Purana Killa; a work which was completed by his conqueror Shir Shah Sur.

This monarch, as already described, destroyed much of Firuzabad and of the other cities about, and commenced walling in a city of his own; a work which the shortness of his reign prevented him from finishing. From this time until the accession of Shah Jahan the capital was rarely fixed at Delhi: but, though much shrunk in size, it still remained a flourishing place. Old Delhi was quite deserted; Jahanpanah and Shahpoor were still inhabited, but very sparsely. Firuzabad was in ruins; and the bulk of the population resided in Shir Shah's city and in the adjacent Ghaiaspoor, which had now become a mere suburb. The palace was inside the citadel of Din Panáh (Purana Killa); whilst, three miles away, was the fort of Selim Gurb, used only as a state prison; at the foot of which lay the ancient Hindu village and temple of Nigumbode.

A. D. 1638 to 1707.—The last change had now come, and in 1638—1648 Shah Jahan founded the palace and city of Shahjahanabad; from which time the city and population gradually shrank to their present dimensions. We learn from Bernier that, in the beginning of the 18th century, the only portions inhabited were the present city; a long chain of buildings near the Lahore gate, the extensive remains of Shir Shah's city, and three or four smaller suburbs. He describes the whole as being $4\frac{1}{2}$ miles long; which is, as nearly as possible, the distance between the present suburb of Kishengunge, outside the Lahore gate, and the large gateway built by Biudzin Khan opposite to the Purana Killa, measuring along what was then the line of communication through the bazaars.

A. D. 1707 to 1803.—The abandonment of Shir Shah's city was gradual;—the troublous times of the eighteenth century forced the defenceless inhabitants to take shelter within the walls of Shahjahanabad; and, when the British forces under Lord Lake took possession of that city in 1803, all beyond its limits had fallen into ruin and decay.

Chronological Table of the various Cities and Forts of Delhi.

1. *Indraprastha*.—Founded about the 15th century B. C.
2. *Old Delhi*.—Founded B. C. 57. Rebuilt by Anangpal I. A. D. 736. Walled in by Rai Pithora about A. D. 1180.
3. *Kutb Citadel*.—Built by Anangpal II. A. D. 1060. Rebuilt by Ala-u-din, A. D. 1304 and renamed by him Siri.
4. *Ghaispoor*.—A palace and fort built here by Ghais-u-din Balban A. D. 1266—1286. Other buildings added by Ala-u-din, A. D. 1295—1316. Was added to at various times and became known in the 15th century as the "new city."
5. *Kilukheree*.—A palace was built here by Möiz-u-din Kaikobad, A. D. 1286—1288. Another was constructed by Jalāl-u-din A. D. 1288—1295, at which time the place was much enlarged.
6. *Togluckabad*.—Built by Ghais-u-din Togluck Shah, A. D. 1322.
7. *Mahammadabad*.—Known also as Adilabad, built by Mahammad Togluck, A. D. 1325.
8. *Jahānpādh*.—Walled in by Mahammad Togluck Shah, A. D. 1325—1351.
9. *Firuzabad*.—Built by Firuz Shah Togluck, A. D. 1354.
10. *Khizrabad*.—Built by Syud Khizr Khan, A. D. 1414—1425.
11. *Mobarikabad*.—Built by Syud Mobarik Shah, A. D. 1435.
12. *Shahpoor*.—Built by Sultan Bhailol Lodi, A. D. 1450—1488.
13. *Purana Killa*.—Built by Humainn, A. D. 1530—1540.
14. *Delhi Shir Shah*.—Founded by Shir Shah Sur, A. D. 1540—1545.
15. *Selimgurh*.—Built by Selim Shah Sur, A. D. 1546.
16. *Shahjahanabad*.—Founded by Shah Jahan, A. D. 1648. Palace commenced, A. D. 1638.

NOTE.—The side brackets shew what cities were contemporaneous with each other.

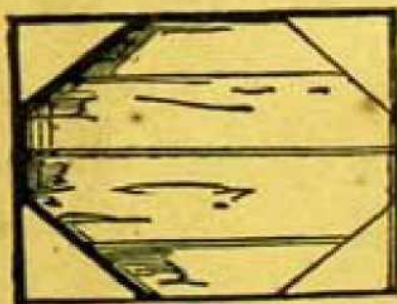
NOTE A.

The existing remains of the Lall Mahal comprise a small domed chamber, a large double storied pavilion, and a few remains of the original enclosure wall built into work of a later date.

In the lower or basement story of the main building, there are several arches of the shape always employed by Ala-u-din, and which can be easily identified as his work. The upper story is composed almost wholly of red sandstone, (whence the name of "Lall Mahal,") and is supported on pillars, so as to form an open hall. It has the appearance of a number of small pavilions, covered with stepped and sloping roofs, grouped around a central dome, which is, in section, a true oval pointed at the apex. This is a shape commonly employed at the commencement of the 14th century.

Small pavilions like the above reappear as a common feature in the architecture of the 16th century, and are much used by Akhbar in his various buildings; but an examination of these later ones shews that

Plan looking up.



they are always* domed under the sloping roof, whereas those in the Lall Mahal are ceiled with large flat stones in the Jaina style, like those in the colonnades of the Kutb-ul-Islam Musjid. This arrangement, so far as Mahomedan architecture is concerned, is peculiar to the work of Kutb-u-din Eibeg, Altamsh, and Ala-u-din.

The style of the ornamentation, of the battlements, and of the mouldings so strongly resembles that in the "Alai Darwaza" at the Kutb that there can be no reasonable doubt as to the two buildings having been designed and built at the same period; and we have thus ample warrant for describing the Lall Mahal as the work of Ala-u-din.

* In Delhi at least; I have never had an opportunity of examining those at Shahdehra or Futtehpore Sikri.

NOTE B.

Extract from the "Ayn Akhberi" of Abul Fazl.

درین شهرهای تحت اندر نام طول صد و چارده درجه و سی و هشت دقیقه اگر برخی از اقلیم دوم برنگارند همانا بعرض حال آگهی بخشند سر اعار کوه جنوبی ازان ستاشد سلطان قطب الدین در قلعه پتهوره بسر سزند سلطان غیاث الدین بلن قلعه دیگر آساست نهاد آنرا مرغرن اندیشد عمارتی بر ساخت دل کشاد کنکار در رسید معزالدین کیقباد بر ساحل جون شهری دیگر گردانید و آنرا کیلو کهری گویند امیر خسرو در قران السعدین آنشهر و این حصر را برستاید و امروز خوابگاه حبیب اسبابی و الاعمارتی نو بران آساست یافت سلطان علاوالدین شهر دیگر بنیاد نهاد قلعه نو بر ساخت آنرا سری گویند تعلق آباد از آثار تعلقشاه سلطان محمد پور او مصر دیگر فراهم آورد بلند الوابی بر افراخت هزار ستون از سنگ رحام بکار رفت دیگر منازل دلکشا بروی کار آورد سلطان فیروز بنام خود شهری بزرگ آباد گردانید و دریای جون را بریده نزدیک روانه ساخت سه گروهی فیروز آباد کوسکی دیگر بر افراخت جهان نما نام فراخ سه لقب زده بود و دین پناه نام نهاده شهر حال علائی و بران کرده جدا شهری براراشت •



Notes on Pilgrimages in the Country of Cashmere. By Major
D. F. NEWALL, R. A.

[Received from the Punjab Auxiliary Branch of the Asiatic Society of Bengal,
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The tendency of the Hindu inhabitant of Cashmere, to localize in his own small, though lovely valley the fabled incidents of his religion, common to all lands where the Brahminical faith prevails, is, I believe, generally known. In putting on record, therefore, a few notes on the pilgrimages of Cashmere, I may be, perhaps merely on a small scale, assigning to local spots the fables which more properly belong to the entire Hindu Pantheon, and have their localities elsewhere in Hindustan.

I proceed, however, to what I find in my notes as No. 1 of the pilgrimages annually undertaken by native Hindus of Cashmere, and which is known as that of "*Amr-nauth*" (Lord of Immortality); and before proceeding to detail the steps of the pilgrimage, a few words of description of this far-famed locality may be interesting: I say far-famed, because the full moon of August annually has pilgrims from all parts of India, as well as Cashmere, assembled in honour of its tutelary Lord.

The gypsum cave of *Amr-eeshur* or *Amr-nauth* (Lord of Immortality), sacred to Mahadeo, is situated in the rugged chain which separates Cashmere from Thibet. Its elevation above the sea cannot be less than 15,000 or 16,000 feet, and even during summer its approach is invested with the snows of winter. Wild fantastic peaks and desolate steppes surround the spot, and the grand old glaciers of Sooroo and Wardwun tower in the far horizon.

Hindus perform a yearly pilgrimage to this shrine, and to a devotee from the city of Srinuggur there are no less than twenty-two places of Snân where religious ablution must be observed, before he can approach the holy adytum, or sacred cave of *Amr-nauth*. Legends or absurd fables are attached to these spots, and the following is a brief record of some of them.

The Hindus of Cashmere, followers chiefly of Siva the "Destroyer," and Ophists, believing moreover their own small valley to contain within its limits the germ or type of the whole Hindu Pantheon,

must needs stumble at every step upon some stock or stone communicative of fabled adventures of their deities; adventures as puerile and fantastic as can be well conceived, containing few elements wise, historic or sublime, not redeemed from utter absurdity by the glory of poetic imagery, nor, like the myths of the Greeks and other ancient nations, by the vigour of a profound cosmogony.

Fatuous ecstasy impressed on their features, the wretched idolaters, male and female, may be seen, stark naked, abjectly grovelling in the snow and dragging their bodies over the "lingum" or "phallic emblem," which in the form of a stalactyte issues from the frozen fount of the "Lord of Immortality."

I could draw attention, however, to these various places of Snân or religious ablution, at the various steps of Hindu pilgrimages, as presenting in some instances objects of archæological interest. Thus one may pass many times along a road without observing any object worthy of attention, until guided thereto by the pilgrim; when, turning a few paces into the jungle at the road-side, some stone or symbol or other object of passing interest to the antiquarian may often be discovered. I beg to note this point as worthy the attention of the members of our Society. I would mention also at this point that in Cashmere, (where the Mahommedan faith has prevailed for about five centuries) it is no unusual thing to see both Hindus and Mussulmans worshipping at the same holy place. This may be attributed, on the one hand, to the Mahommedan in some degree still clinging to the superstitions of his ancient Hindu ancestors; and on the other, *i. e.* in the inverse case of a Hindu worshipping at a Moslem shrine, to the fact that the fragments of many overturned or ruined Hindu temples have been used in building the Mahommedan mosque or zearut. I could instance examples of both these cases. With these remarks I proceed to the actual detail of the pilgrimage to *Amr-nauth* as detailed in the Shastr on the subject, and as partially verified by myself as to the localities of the various stages.

Proceeding from the city of Srinuggur on the seventh day before the full moon of August, the pilgrim proceeds up the river Jhelum (or Vitastá) and arrives at the first place of Snân or religious ablution, called "*Shriya*," the whole or collected waters of the valley previous to its desiccation by the Múni Kashiapa. I am not aware of any

symbol or remnant of antiquity at this step, which is literally a "bathing-place" on the river near the island above the city.

(2.) The pilgrim next arrives at "Pandrethon," where the foot-step of Suttee, the wife (or active principle) of the Destroyer appears to her enamoured lord in his pursuit of the flying fair. The temple at this place is well known, and has been described by far abler pens than mine. I may, however, briefly mention that it was built about A. D. 913—921, in the reign of king Pārtha, and escaped destruction when the ancient capital was burnt. It was subsequently, perhaps, used as a Mahommedan tomb, and so again escaped destruction at the hands of the fanatic zealots Shahabooddeen Sikunder Būtshikan and others. It stands in the centre of a tank 125 feet square, is 22 feet in size, is dedicated to Siva, and is not a Boodhist temple as stated by some.

(3.) The next forward step on the pilgrimage is "*Padinapore*," city of Lukshmi (dweller in the Lotus flower, (*padam*.) There are here a few ruins, a high phallic column, and I believe others, but I forget their exact nature, and my notes are silent on the point.

(4.) *Jubroroo*, (Love of Youth) sacred to Sheo and Mahadevi: a lingam or phallic emblem is, I think, the symbol at this step.

(5.) *Awentipore*. The city of king Ven or Awenti, who acquired the power of walking on the water from his zeal in the worship of Siva. In his time the great flood occurred which overwhelmed the cities of the valley, so the powers attributed to him in the Shastr may perhaps have proved useful. There are some rather extensive ruins at this place well worth a visit.

(6.) *Hurriepore*. The city of Ganesh, the elephant-headed—yellow.

(7.) *Wagahamoo*. House of Wâg (spirit of the air, aider of the Immortals) from whose weedy fountain cornelians are said to be ejected—a pool or spring.

(8.) *Husti-ki-nar-keoun-Nargum*. "The breathing of the ears and mouth of the elephant" (Gánesh.) The fable on this head is too absurd and puerile to be noticed, and is one of those which led to my general remarks on the subject at the head of this paper. In fact, I may say generally that in the Shastr detailing this pilgrimage, fables of intense absurdity are attached to nearly all these places,

many of them expressive of the blandishments, or amatory phases, of the pursuit of Mahadevi or Suttee by the *creative symbol* of her consort the Destroyer, a disgusting and fantastic myth too indecent to be more than remotely alluded to.

(9.) *Chakredhar*. The abode of the *Quoit-thrower*, an agnomen of Vishnoo.

(10.) *Deokie-zan*. Wife of Hurrichundra Raja.

(11.) *Wuzzeeshur*. A name of Mahadeo signifying the conqueror.

(12.) *Hurrichundra Raj*. The palace of king Hurrichundra.

(13.) *Tejwarrah*—the abode of Mahadeo.

These four last are portions of the once famous city of old Rajbarrie (or Bijvihara) whose temples, including one hundred phallic columns, were overthrown by the Moslem zealot Shahaboodeen.

At *Hurrieeshur*, a ghât on the river on the upper side of the modern town, are grouped some very remarkable fragments well worthy of minute observation. The word signifies "Father or Giver of all."

(14.) *Soorie Goophar*. "Caves of the sun." At this place it is fabled that Mahadevi was pursued by the Demon Bamásoor (enemy of the whirlwind.) She thereupon prayed to Siva for power to destroy the demon, who was accordingly annihilated by fire, and his name hence changed to Busmáswár (the enemy burnt by fire). This cave is not the celebrated cave of the sun at Martund, I think, but one on the hill-side on the right bank of the river Liddur (or Sumbooderi,) but I have not visited it.

(15.) *Succur-gaom*. The trunk of the elephant (Ganesh) is here supposed to be visible beneath the waters of the Liddur or Sumbooderi (swallower of waters.) This river joins the Jhelum at Bijvihara.

(16.) *Buddraroo*. The place of embraces.

(17.) *Sullur*. The place of generation.

(18.) *Ganeshbúl*. River of Gánesh. The pilgrim bathes at *Bruggaterut*, the shrine of "Brug," a devotee.

(19.) *Neela Gunga*. Mahadeo here applied the "soorma" to his eyes which gave the blue colour to the Gunga, a river which is fabled to have flowed from his head.

(20.) *Tandshur*. "The fixed abode," because here Mahadeo became stationary. This place is a camping ground near the Séshnâg lake, a fine sheet of water which is passed by the pilgrims on their way to the next and last step of the pilgrimage, but which does not become invested with an eminently sacred character until their return from the cave of Anerreth.

(21.) *Panch Taringini*. The five rivers proceeding from the head of Siva. At this beautiful spot the pilgrims encamp and pass the last night of the pilgrimage previous to their ascent to the holy caves.

(22.) Commencing the ascent in the early morning, the pilgrims pass by the holy rocks of Amreeshur (giver of immortality,) whence issues the philtre of immortality proceeding from the crested head of Mahadeo, the drink or ichor of the immortals.

Here the devotees may be seen rolling on the ground amid the snow and ice, ecstasy depicted on the face at the idea of divine afflatus. Retiring from the caverns, they return to Panch Taringini, and then again pass the night, preparatory to their return journey down the valley to the Seshnâg Lake, where they finally bathe. The pilgrimage is then complete, and the pilgrims disperse to their respective homes. It is fabled that amidst the rugged peaks surrounding this Lake lived Watasnâr, a spirit of the air, who, having chased away the host of heaven, thus established a tyranny until slain by Mahadeo, who after this adventure is fabled to have "rested on the bosom of Séshnâg;" Séshnâg being represented as a huge serpent with 100 heads. A picture of this touching spectacle is in my possession, and a curious production it is, and suggestive of the "ophistic" nature of the worship of the Hindoos of Cashmere.

* * * * *

I have the details of 11 other pilgrimages to various parts of Cashmere, varying in length; that to the sacred lake of Gungabul under the Hur-mookh peak is the next longest, although several of the minor pilgrimages involve a graver issue to the devotee. Space will not permit me, in this paper, to do more than note the salient points of a few of these.

(1.) The pilgrimage of *Hur mokter Gunga* (or Gungabul) above alluded to, in the Lar pergunnah, is to be found in the Gunga Maha-

tim Shastr. There are 14 places of snân or religious bathing in this pilgrimage; the last being the holy lake of Gungabul in which the Hindoos cast the ashes of their deceased relatives. The time for this pilgrimage is midsummer.

The return from this brings us to the highly interesting ruins of Razdân or Razdoing; the only important temple of Cashmere not noticed by Cunningham, a detailed description of which I may perhaps be able to afford in a future paper.

(2.) The pilgrimage of *Martund* in which are seven places of snân.

(3.) Pilgrimage of *Vetusta Khoond* the source of the river Jhelum or *Vetusta*, in which are ten places of snân.

(4.) Pilgrimage to *Suhoojun Teerut* the burning ground—three places of snân.

(5.) Pilgrimage to *Kúpál Muchám* (the escape of the head from sin), undertaken by criminals for the release of sin.

(6.) Pilgrimage to *Sheeva-Devi*.

(7.) Pilgrimage to *Kûnhyie Matár*,—four places of snân.

(8.) Pilgrimage to *Teiposh Kur* in the Bongil pergunnah,—two places of snân.

(9.) A second pilgrimage to the *Vetusta Khoond*,—eight places of snân.

(10.) A fabulous pilgrimage or progress of Raja Bhagérut, the tutelary genius or deity of the river *Vetusta* or *Jheelum*,—ten places of snân, and this closes the catalogue of my notes on this subject.

No. 2.

The pilgrimage of Hur-mooktur Gunga (or Gungabul), in the Lar Pergunnah, as detailed in the Gunga Mahatim Shastr.

As stated above, there are 14 places of "snân" or religious bathing to be observed in this pilgrimage; viz. 10 previous, and 4 subsequent, to the pious act of casting the ashes of deceased relatives into the holy lake, in whose mournful waters lie the ashes of generations of Hindoos.

The writer of this paper will not easily forget the impression, the view of the cold still waters of this desolate laké produced on him, viewed as they were about sunset one autumnal evening, a snow storm

beginning to set in off the lofty granite peaks of Hurmookh, its guardian mountain, whose dark shadow fell across the mournful waters of the lake.

However not to occupy time, I proceed to the detail of the stages of the pilgrimage, as detailed in the Shastr mentioned at the head of this paper.

Four days before midsummer, the pilgrim, having collected the ashes of his relatives deceased during the year, sets out from the city and proceeds to the first step of the pilgrimage, namely, "*Vecha Khoond*," the pool of the creator, or Brahma, who at this place is stated to have created "*Vishnoo*," the preserver, the 2nd person of the Hindoo Triad. This is an interesting pond surrounded by willows and other foliage, about a mile from the shores of the Dhull lake on the road towards Lar.

(2.) Having passed through the sedgy marshes which border the Hákrit-bul or lake of weeds, the pilgrim approaches the second step, *Gundoor-nugger*, city of the Gandoors or angels. There are here some ruins of what must formerly have been an extensive city. They are mere fragments; but it is probable that objects of interest might be discovered here amidst the marshes and weedy flats formed by the Sind river, which is lost amidst the creeks and sedges of the Hakr-sir lake in the close vicinity, could the means and leisure be obtained for the search.

(3.) The next step is *Màhírjī-gāon*, the residence of Mahadevi who there forbad her consort to approach: this is implied in the word—Ma (do not) zih (come).

(4.) *Numoor*,—the bathing-place. A pretty village in the Sind valley near the river. There are a few mines, tanks, &c.

(5.) *Karrung-ka-Nuddie*,—a residence of Vishnoo; Karrung being a name of Vishnoo signifying "granter of prayer."

(6.) *Ramaradun*. Place of prayers, being the forest where Raja Bhágeerut established himself for prayer to Siva.

(7.) *Mahulish Merg*,—"the meadows of the buffalo," so called because Sutte is here fabled to have roamed about, like a buffalo feeding, whilst in search of Mahadeo, her consort.

(8.) *Humsádar*,—"the gates of King Huns" (the swift one), a name of Raja Bhagéram, who is stated to have here cleft the pass with

an arrow. On the road we pass several small lakes, amongst them those called Bráhmisir and Ashiféroo.

(9.) *Nundi-kettur*. The abode of Nandi the attendant bull of Siva. This is a very interesting lake, also close under the peak of Hurmookh, and divided only by a narrow ridge from Gungabul.

(10.) *Gungabul* or *Hurmookhtur Gunga* (Hur-Siva—Mookh head Gunga river,) — the river or water proceeding from the head of Siva. In this solitary mountain lake, the Hindoos, as before mentioned, cast the ashes of their deceased relatives; which after incrimation are collected and here conveyed once during the year, at midsummer. Having reached this utmost point of the pilgrimage and performed the proper rites (which I cannot, however, narrate, having visited the spot in the late autumn of 1852, long after the time of the pilgrimage,) the pilgrim commences his return by a different route; and after a long and fatiguing march, quits the higher range of hills and descends to the *Nara Nag* (11) or Lake Getara which may be considered the 11th place of snân of this pilgrimage, which is not yet completed. On the banks of this pool (for it is little more) the pilgrims leave their grass hill shoes (phoolas) and hill sticks; many of which I observed lying about. This pool is closely adjacent to some very remarkable ruins—those of Razdoing, which I propose to make the subject of a separate paper. A *Sonne*, or mysterious afflatus, is supposed to proceed from these ruins, a particular portion of which is especially held sacred by the pilgrims who salaam there before leaving the spot. *Nára* is a name of Wussisht Bhugwan, (son of Brahma,) who is stated to have here worshipped Siva.

(12.) *Wangût*,—Wan being a name of Surroosuttie, consort of Brahma, signifying “the Talkers.”

(13.) *Woosun*. The place of *all* the shrines as implied by the name. There are several small temples in the vicinity of these two last-named stages.

(14.) And last. The pilgrim has now re-entered the Sind valley and proceeds down it on his return journey, repassing successively (without however the necessity of ablution) Nos. 5, 4, 3 and 2 of the pilgrimage, until he comes again to No. 1, viz. *Vecha Khoond*, where he finally bathes, and the pilgrimage is complete.

I would indicate *Gandoornugger* No. 2 of the pilgrimage as a pro-

mising locality for excavation, and the ruins of *Razdār* or *Razdoing*, the only group of temples not noticed by Cunningham (to whom, however, I long ago communicated their measurements and description,) deserve a far more searching investigation than the very cursory one I was able to carry out during the short visit I paid them in September 1852.

I now proceed to give outlines of the remaining pilgrimages of which I possess notes.

No. 3.

The pilgrimage of *Martund* I find as No. 3 of those in my journal. *Martund* properly so-called, and not "Muttun" or "Matan" as frequently written, leads the pilgrim from Srinuggur up the river and over much the same ground as that to Amernauth, although the places of snán are different. These are as follows :—

(1.) *Deokie Yar*,—Sacred to Deokie, wife of Rajah Hurrichund.

(2.) *Doomia Shrúm*,—The abode of a devotee named Doomia.

(3.) *Anant Nág*, which is one of the pools or tanks at Islamabad, Anant being a name of Vishnoo. These tanks, filled as they are with fish of the carp tribe (*ciprinidæ*), have frequently been described by travellers, and need no mention.

(4.) *Gutim Nág*,—pool of Gotima, a devotee. I believe this is also one of the tanks or springs at Islamabad, and the description of No. 3 may perhaps apply to this.

(5.) *Charkabul*, so-called from "*chark*," the fissure or spring head of the stream fabled to have issued from the cleft in the sun as described in the following :

(6.) *Martund*—(*Mart*, the fissure—*Und* open). Mahadeo is fabled to have possessed three eyes,—the "Sun," the "Moon," and the "Subterranean Fire." He threw down the eye forming the Sun on Martund, which being broken, from it flowed the pool and stream of Martund.

This well-known spot has been too often described to require further notice here.

(7.) The pilgrim returns by *Anant Nág*, the No. 3 of this pilgrimage, where he bathes, and the pilgrimage is complete.

No. 4.

I now proceed to detail the pilgrimage of *Vetusta Khoond* (Virnag)

the source of the river Jhelum. Again the pilgrim, departing from Srinuggur, proceeds up the river over nearly the same ground as the foregoing, and passes the following places of holy ablution:—

1. *Sooneyar*. The place of the moon.
2. *Gunputyar*. The place of Gánesh.
3. *Mullyar*. Sacred to Brahma; Mull being a name of Brahma.
4. *Shriya*. "The whole." See No. 1 of the pilgrimage to Amer-nauth.

5. *Bejbeharie* (or *Bej-leshur*) "giver of aid," built by Hurrichundra Raja, has already been described. In the details of this pilgrimage an absurd story is narrated of Mahadeo in reference to a certain devotee's wife (the lady's name is discreetly suppressed), in whose house the hundred Lingums or phallic columns of Bejbiharie are stated to have been constructed.

6. *Waupoosh*, a part of old Bejbeharie.

7. *Hur Nág*,—Sacred to Mahadeo; Hur being a name of that deity.

8. *Virnág*. Sacred to Mahadeo, giver of orders. This beautiful fountain, the reservoir of the spring head of the Jhelum, has been often described, and is too well known to need notice here. The circumjacent buildings are Mahomedan, but from the Hindoo legends attached to the locality, they are held sacred by men of both creeds. The same remark applies to Anant Nág (Islamabad), Bala Pam Rishi, Keer Bownie, and numerous other localities in Cashmere.

(9.) *Vetusta Khoond*,—the actual spring head or fountain of the river Jhelum. The name *Vetusta* signifies a "span," the imaginary width of the stream at its source.

(10.) Return viâ *Baramoola* to *Kootee Teerut* the 10th, and last step of this pilgrimage, (signifying a crore or the junction of a million teeruts), bathe, and the pilgrimage is complete.

No. 5.

The pilgrimage of *Suhoojun Teerut* or the burning ground.

1. *Mahadamuttie*.
2. *Luhoojun* (spontaneous fire from the earth), of which the following is the fable.—The gods being here assembled for prayer to Mahadeo, were interrupted by the demons (*Rakhshusas*), whereupon Mahadeo raised fire from the earth in order to destroy them. To the

present day the earth there is combustible; and at times grows hot enough to cook rice. When this is known, the Brahmins from all parts of Cashmere flock there.

(3.) Return by Mahadamuttie again, bathe there, and the pilgrimage is complete.

No. 6.

The next I find is that of the pilgrimage of *Kupál Múcham*, which has already been alluded to as involving a grave issue to the Hindu undertaking it. The following is the description given in the Shastr. Siva (Mahadeo) had slain the wife of a demon (Rakhshus), and was pursued by the sin (or nemesis) of the act. By the advice of the "sun" or luminous emanation of Mahadeo, who is stated to have dwelt at Shupeyon, he formed a "Nag" or fountain for the purification of sin. This pilgrimage is accordingly resorted to by great criminals. "Even the slayer of a hundred Brahmins may be cleansed from his sin by the performance of ablutions in the *Kupál Múcham Nag*," "Lake of the escape of the head from sin." The time of this pilgrimage is midsummer.

No. 7.

A pilgrimage to *Shewa Devi* in the Bring Pergunnah for retired devotees only. The Nag or Lake is sacred to Siva, but I find nothing further noted in regard to this pilgrimage, nor do I know its exact locality. I believe, however, it is near Shahabad, towards the Meribul pass.

No. 8.

I now proceed to No. 8, or the pilgrimage of *Kúnie Mátár*, which leads the pilgrim down the river to *Baramopla* (more properly Wara Mool, *Wara* being a name of Vishnoo, the preserver, signifying the "Hog," who is fabled to have at this place rooted up the earth of the valley from beneath the water of the primæval lake, in fashion of a hog, with his tusks) This of course bears reference to the Hindu fable of the original desiccation or draining of the valley by the Muni Kashyapa, in which he is stated to have been assisted by Vishnoo.

(2.) *Papaharun Nag*,—"The pool of the putting away of sin." The 2nd step of this pilgrimage is fabled to have been formed by Mahadeo

at the request of Vishnool, in order that his disciples might escape the destructive vengeance of the former deity.

(3.) *Kinchijie Mátár*,—"The rock of the mother" sacred to Mahadevi. Siva, whilst here engaged in self-meditation, was disturbed by a demon whose destruction followed.

(4.) Return, perform snán again at *Baramoola*, and the pilgrimage is complete.

No. 9.

The pilgrimage of *Tripoosh-kur* in the Bongil pergunnah, a spring of water so called as being the supposed place of meeting of Brahma, Vishnool, and Mahadeo, the Hindu Triad, being literally the meeting of the three. The Shastr, interpreted by a Brahmin worshipper of Siva or Mahadeo, says, "Here pray to Mahadeo!" I may as well, perhaps, take this opportunity of saying that the details of all these pilgrimages were obtained through a Brahmin of this sect, a wretched old man, whose sympathies may have led him to exaggerate the importance of the localities and pilgrimages sacred to the Destructive Principle, the object of his peculiar veneration, at the expense of the remaining personages of the Hindu triad.—However, to proceed to the next step of this pilgrimage. (2.) "*Karg*" the eater. Here "*Grúd*," the bird-like steed of Vishnool, was seized by a serpent god who began to eat him. Here snán must be performed. The pilgrim must remain three days in prayer to Vishnool the preserver, and the pilgrimage is complete.

No. 10.

A second pilgrimage to the *Vetusta Khoond* (see No. 4,) is as follows.

(1.) *Kanibul*—Kani being a name of Siva.

(2.) The *Teerut* at the juncture of the *Vetusta* and *Sumbooderi* or *Rhiddur*.

(3.) *Deokie Zar*. (4.) *Bejbeharie*. (5.) *Sungum*. (6.) *Shriya*. (7.) *Mullyar*. (8.) *Gunputyar*. (9.) *Soomyar*. (10.) *Baramoola*.

I find this noted as above, but it appears to be a sequel or return pilgrimage from *Vetusta Khoond* or *Virnag*, viâ *Wanpoo Harnag*, and thence to the points noted: *Kanibul* being at the bridge of Islamabad.

No. 11.

I now come to the last pilgrimage of which I have noted the details, and which may perhaps be almost more properly called a fabulous account of the river Vetusta, as I am not aware that it is at any time undertaken by the Hindus of Cashmere, and as I rather think that some of the places named are under the waters of that river. I extract exactly as I find it in my notes.

“Fabulous account of the origin of the river Jhelum or Vetusta.”

“Mahadeo being here engaged in self-contemplation, Raja Bhágérút arrived, and prayed for a Nág or spring in which to bathe and be cleansed from his sins. A stream then issued from the head of the destroyer which, on arriving at *Wampoo*, was *swallowed* by a certain demon, rejoicing in the name of *Kalneemie Assur*. A second spring was in like manner swallowed by the thirsty demon. Whereupon Raja Bhágérút descended from his place of prayer at Vetusta Khoond, and engaged the demon, whom, after a brisk encounter (described in the graphic language of the Sanskrit ring (sic in MS.) he is stated to have “*injured, but was unable to destroy or drive away.*” (Kalneemie Assur had probably graduated in the Vedic art of self-defence!) In fact it seems a polite way of stating that the Raja got the worst of it, as the demon is stated to have “*given chase,*” and to have come up as far as Hurnag (Virnag) in pursuit. At this, however, the wrath of the destroyer was aroused. He encountered the demon, and slew him, got his “*head in chancery*” and finally “*grassed*” him.* I have in my possession a picture of this event where Mahadeo is represented as literally “*sitting*” on his face! Lion (or Mahadeo) then commanded the spring to follow Bhagirat Raja, who, descending the valley, passed successively.”

1. Kanibul. 2. Sumbooderi Tirat.

3. Deokieyar. 4. Bejbeharie. 5. Sungum.

6. Shriya. 7. Mullyar. 8. Gunputyar.

“9. Soomyar. 10. Baramoola, the residence of Raja Bhágérút, and where the pilgrimage terminates.” Thus far my notes! These places represent the course of the river, and seem nearly identical

* I am unable to translate with sufficient unction the various phases of this grand passage of arms (or wrestling match) between the two champions; and I hope the Society will pardon the terms employed as equivalents.

with those detailed in No. 10, pilgrimage, but as they are noted as separate, I so transcribe them. I may mention that the notes from which the above pilgrimages have been taken were made fourteen years ago, and in a few instances may contain inaccuracies, as my almost total ignorance of Sanskrit may have led me to misunderstand in some few instances the translator, who read to me in *Persian* his own versions of the Brahminical fables. For myself I confess to an utter distaste for this especial branch of research. The Hindu religion, as interpreted by its wretched representatives of the present day in Cashmere, seems a base alloy, and a corrupt and paltry veneering over the fables (themselves absurd enough) of the later Vedas..

The original grand and pure moral code of Mēnu seems quite lost sight of;—priestcraft and abject superstition have of course stepped in and vitiated fables already sufficiently gross and material in their symbolical Vedantism; whilst the petty ceremonial customs and observances of modern Hinduism can only excite ridicule and disgust in the mind of the student. I have long desisted from the uninviting pursuit, and it is with much distaste that I have now transcribed, from notes and data long since collected, these few details, which, however, I was unwilling should altogether be lost, as they may tend to guide abler scholars to deeper research than I was ever able to make; and possibly in some of the localities alluded to, inscriptions, or other fragments of interest to the Society might be found. Apologizing for the fragmentary character of this paper, I will now bring it to a close, as the subject has been, as far as I am concerned, exhausted.



A Vocabulary of English, Balti and Kashmiri, compiled by H. H. GODWIN AUSTEN, Capt. H. M., 24th Regt. Topl. Assist. Gt. Trigl. Survey.

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This Vocabulary of Kashmiri and Balti words was compiled from time to time in leisure hours of rainy days, while surveying in those countries. It does not profess to be strictly correct, being taken from so many sources, in so many parts, and from, generally speaking, the common people. Several of the words may possibly be only common to a single district or valley, which is frequently the case, especially in those least frequented, or where the people are a mixed race, as in the Kishengunge, Wurdwan and the upper part of Dras valley.

In the Balti words, those having the first, second or third letters marked with dots under them or a line, as ish *ish*, such syllables are slightly sounded before the word of which the full sound follows after, which is a peculiarity of the Tibetan dialects,—as also the letter TZ and TS.

Parts of the Body.

<i>English.</i>	<i>Kashmiri.</i>	<i>Balti.</i>	<i>Kistwari, &c.</i>
Ankle.	Gīt.	Kámi Gūt.	git.
Arm.	Nur.	Prúkhpa.	baon.
Armpit.	Kūtz.	.....	kuchali.
Beard.	Dhor.	Smūkra.	H.
Belly.	Yūd.	Thoáh.	eed.
Body.	Pan (fr tun s.)	.....	zieu.
Blood.	Kūth (fr rakh s.)	Krūk.	rath.
Bone.	Udidj.	Rúspa .	H.
Bowels.	Andrum.	r. Gúah.	H.
Brain.	Wūs.	Klūtpah.	mèzo.
Breast.	Wūch.	chu chu.	H.
Do. of a woman.	Būb.		H.
Calf of leg.	Groz.	.....	pini.
Cheek.	Gūll.	Mūngūl.	kakri and gul.
Chin.	Hongeing.	Kosko.	chùn si.
Corpse.	Mād.		H.
Buttock.	Sūkūdj.	.....	gūltsūndo.



<i>English.</i>	<i>Kashmiri.</i>	<i>Balti.</i>	<i>Kistwari, &c.</i>
Ear.	Kūn.	ishná.	H.
Elbow.	Kūnwūt.	Párúks, krimoks.	kúndori.
Eye.	Oitch.	Mikh.	atch.
„ ball.	Lál.	.....	.....
„ brow.	Boomb.	Sminma.	brahmoo.
„ lash.	Oitcher wal.	Mikh shok.	parh.
„ lid.	tor.	Mikh Phūk.	niali.
Face.	Bhút.	Okdong.	H.
Finger.	Ongegee.	Zúgú.	H.
„ little*	Kis.	Tibichúng.	kunèti ungoli.
Thumb.	Niet.	Tècho.	noth.
Flesh.	Marz.	Shè (short).	mas.
Foot.	Khore.	Kūngma.	khor.
Forehead.	Dèker.	Spūlbah (tail—)	kapal.
		Gonchero.	
Hair.	Mus.	Gospo (Locks—)	
		Snūs kore.	
		also Wal (bal) kesh.	
		in Hind.	
Hand.	Áther.	Lukpa ལུཀཔ	H.
Head.	Kūlla.	Go.	roth.
Heel.	Kour.	áth Stingma.	thùr-rhi.
Knee.	Kot.	Būkhmo.	khùtha.
			zanoo.
Knuckle.	Mūrm.	Gut, the condyle	anguli ka bat.
		of any bone.	
Leg.	Zūng.	Zúk.	H.
Lip.	Wúbh.	Kūlpūkh.	oth.
Liver.	Kreu marz.	Chinma.	H.
Lungs.	.....	Huing.	shunknar.
Marrow.	Wūs.	.....	dūndh.
Monstaches.	Gontsè.	Sūmdūl.	H.
Mouth.	Aos.	Kūkore.	ási.
Nail.	Nūm.	Zermúns.	noth.
Navel.	Tún.	.....	bontú.
Neck.	Hôte.	Zgema-zingma.	tanth.

<i>English.</i>	<i>Kashmiri.</i>	<i>Balti.</i>	<i>Remarks, Kishtwari, &c</i>
Nose.	Nust.	Snümzúl.	H.
Nostril.	Nuk werq.	—shong.	nūshkuli.
Palm of hand.	Müns Athèr	Lūk tul.	H.
Penis posterior.	Momur.	.....
Rib.	Kūd.	.....
Spittle, saliva.	Thōk.	Thú.	H.
Shoulder.	Pheuk.	Spú mah, rostnd.	H.
Side.	hul kain.	Sthèmah.	stong tong.
Skin.	.....	Bukhsa.	niali.
Sinew.	.....	.....	sir ?
Breath.	Zámun.		
Skull.	.....	Spièn.	taloo.
Sole of foot.	Tul Poot.	Kan thil.	tulwai.
Sweat.	Gúmer Arakh,	Khmúl choo.	pursa.
Thigh.	Zang.	.....	tussi.
Throat.	.....	Stergong.	
Toe.	Niet.	Kami thècho.	pair ke nōth.
Tongue.	Ziau.	Ché.	zib.
Tooth.	Dand.	Tso.	H.
Urine.	Mütter.	.....	choti.
Vein.	Rüz.	Tsa.	sir.
Waist.	Trek.	Skètpa.	müdz.
Womb.			
Wrist.	Hotz.	Lūkipramo.	binai.
Lip (2nd time.)	Wúth.	Kūlpūkh.	
Back of hand.	.....	Lūk pir dong.	H.
Temple,	.....	Sna mik.	phūrni.
Heart.	.....	tloah.	H.
Lungs.	.....	Lering.	
Small of back.	.....	Sketpah.	H.

EATABLES, DRINKABLES.

<i>English.</i>	<i>Kashmiri.</i>	<i>Balti.</i>	<i>Kishtwari.</i>
Bread.	Jsoát.	Kúrba.	
Butter.	Thein.	Karpo marh.	nūni.
Arsenic.			
Assafoetida.	.....	.....	gunka.

English.	Kashmiri.	Balti.	Remarks, Kishtwari, &c.
Aderuk, Ginger.			H.
Cheese.	Tsamun.	Pruse.	H.
Cocoanut.	Kúpŭr.		
Butter milk.	Gúrŭs.	{ Dŭrba. S. fr. Go a cow and Rus, juice.	
Dŭnea.	Dainwul.	Oosú.	H.
Eggs.	Tool.	Biepjhun.	tool and H.
Fat.	Churb.	Tsil.	meuz.
Fish.	Gadè.	Nya.	H. [thús.
Flour.	Ort.	Bŭkhphe(wheat)	thrús phè (grain)
Ghi.	Ghiau.	Marh.	H.
Gour.	Gore.	Same.	H.
Gum-arabic.	Sŭmbŭk.	.....	Kurmiachi.
Honey.	Marnch.	Z. Biangtsi.	marchi.
Meat.	Nátè.	Shă.	mas. <i>Punjabi</i> .
Milk.	Doad.	Omah.	H.
Longue (cloves).	Rong.	Zèru.	H.
Rice.	Tomul.	Brŭs	H.
Salt.	Nún.	Pyyon.	loon.
Sugar.	Mishere.	H. Kurrah	H.
Tea.	Chaie.	chá.	H.
Water.	Ab	P.choo. Kashmir.	H.
Pepper (black).	Krún Maritz.	Sneerma (kachúl)	H.
Do. (red).	Wŭzl do. or waugun waritz.	Sneerma.	pipli H.
Huldi.	Jider.	Yŭng.	H.
Elachi	Aler.	Eler.	H.
Zira.	Zieur.	Thŭlè.	H.
Saffron.	Kong.	Kŭr kŭm.	H.
Sulphur.	}	Den, Mŭzi.	H.
Vinegar.		same as Hind.	H.
Apricot oil.	.....	Chŭli mar.	H.
Mace (dal chini),	.....	same.	H.
Opium.	.....	aphine.	aphoo
Poison.	.....	Tŭk.	H.

English. Kashmiri. Balti. Remarks, Kishtwari, &c.

PARTS OF A HOUSE, ITS FURNITURE, &c. &c.

Basin.	Lügün.	Karyül.	pholoo.
Ghusal-khana.	Seran küt	.....	none.
Beam.	Konib.		H.
Bed.	Charpai.	same as Hind.	küt. kat.
Bell.	Rúnyè	Züngül, Tripshil.	H.
Bellows.	.....	S. Bûpa.	dûmni.
Blanket.	Tsader.	Karh.	H.
Bolster.	Shondgon.	is Niüs.	shirana.
Cage,	pingürá.	same as Hind.	H.
Cradle.	münzül	.....	phüngûra
Curtain.	purda	same as Hind.	H.
Door.	Bar	z. go.	doar. H.
Fan, Punka	Wáwüz	Bianyep.	H.
Hinge.	Kieal.	.....	none.
House.	Lürh, Nüns.	Nüng.	H.
Jug.	Nore.	.....
Key.	Koonj.	Limik.	H. and P.
Knife.	Shrák.	Gri.	P.
„ clasp.	„ púeh.	.....
Ladle.	Bod chonch.	Zerbû	Dokhi.
Lamp, chirag.	Tsongh.	Skongbû.	H.
„ wick.	Sorth.	.....	H.
Lock.	Kûluph.	Tzimah.	H.
Mat.	Wüggoo.	Wüggá.	phuri.
Spoon.	.....	Phrawün.	
Paper.	Kákúd.	Shok shok.	H.
Pestle & mortar.	Kauj	.....	H.
Mortar.	Kajwüt	.....	H.
Pestle for rice.	Mohul	.....	mossul.
Mortar do.	Künj.	.....	ookah.
Pestle worked with the feet.	Inder mohul.	.....	junder mossul.
Pillar.	Thüm.	.....	kauth.
Plate.	Bán.	.....
Gunpowder.	Shorè.	Ismun.	P.

English.	Kashmiri.	Balti.	Remarks, Kishtwari, &c.
Quilt.	Lèhāf.	likto.	
Roof.	Tálo.	.....	H.
Room.	Kút.	.....	P.
Weighing-scales.	Trúkr	Trúkri.	Trúkri.
Sealing-wax.	Lach.	.....	H.
Sieve.	Pairam.	Dundul.	H.
Ditto for chuck- ing up grain.	Shúp.	phailo.	chúdi.
Spoon.	Chonch.	...	
Spout.	Nore.	.....
Stairs, Ladder.	Hare.	.....	shiri.
Tray.	mujma.	.....
Veranda.	Dalan.	.....	pusara.
Wall.	Dos.	.....	kanth.
Water jar.	Note.	Bajho.	H.
Fork.	.....	Kutsè.	H.
Window.	Dore.	.....
Well.	Krúre.	.....	none.
TRADES.			
Baker.	Kaseder : the fem. is termed as in Hind. kanderi.	.....	none.
Barber.	Nawid.	Takúr.	H.
Blacksmith.	kar.	Garba.	H.
Boatman.	Hanz. <i>m.</i> huzni <i>f.</i>		H.
Carpenter.	Chan.	shingkün.	trakn P.
Cowherd.	Goor, Gopanroch.		H.
Fisherman.	Gad Hauz.	.....	none.
Goldsmith.	Sonur.	serghr.	H. & P.
Groom, syce.	Chur badár.	chirpon.	Ghora ka tailia.
Husbandman.			
Labourer, cooley.	mazúr.	khúrpah.	H. & P.
Merchant.	Sodāghr.	t Songpa.	H.
Milkman.	Gour.	.....	{ none in Kishtwar &c. low and disgraceful to sell or weigh out milk.
Milk woman.	Gour Bai }		

<i>English.</i>	<i>Kashmiri.</i>	<i>Balti.</i>	<i>Remarks, Kishtwari, &c.</i>
Oil-maker.	Til wain.		
Meter.	Watil. <i>m.</i> watidj <i>f.</i>	.....	chūra-phungi.
Painter.	.....	same as Hind.	
Physician.	.....	Do.	bèdh.
Potter.	král.	Zũmkũr.	
Shepherd.	Páhũl.	Lukzi.	gũddi.
Shoemaker.	Múch.	th Lũmkũn.	H.
Tailor.	Sútʒ.	Heelũm.	sochi.
		jikardo.	Kunmug.
Washerman.	Dob.	Chũk chũk kũn,	H.
		Gosneakũn.	
Waterman or Beastie.	} Sáker.	Chúpah.	H. mashki.
Cook.		Hásari.	aboti.
Musician.		Mon.	H.

MANKIND.

Bachelor.	Anhor.	.....	kowara.
Boy.	netchú.	Bhú,(Prú maug)	mũtha.
Child.	shúrú.	....	do.
Dwarf.	Tsot.	Chũt.	
Girl.	Koor.	Bhúmo.	kùri.
Infant.	Mausmahũn.	Tsúntsè.	none.
Man.	Maneo.	Mee.	H.
Maid.	Unhurish koor.		H.
Married man.	none.		H.
Married woman.	none.		H.
Orphan.	Vatim.	same as Hind.	shonda.
		Todtsè.	
Widow.	Mond.	Dokpo.	Rand.
Widower.	.....	Phoriung.	none.
Woman.	Zenana.	Bústring.	P.
„ unmarried.	.....	Phoriang.	
Bridegroom.	.....	Bokhpo.	ĩmarai and lara.
Bride.	.. . .	Bokhmo.	Lari.

ANIMALS.

Camel.		Snango.	H.
Ass.	khũr.	Bormboo.	khota.



<i>English.</i>	<i>Kashmiri.</i>	<i>Balti.</i>	<i>Remarks, Kishtwari,* &c.</i>
Mule.		kuchil.	H.
Baboon or } Monkey }	ponz.	Shèdi (large) Wendon.	H. H.
Bat.	Rat kreel.	† Senbiu.	cham chirik.
Bear.	Harpet.	Drengmo.	{ black—reech. red—braboo.
Buffalo.	Mansh.	Mahi.	H.
Bull.	Dund.		H.
Cat.	Brèref, Brore. <i>m.</i>	Billa.	bilari.
Cow.	Gau.	Balang—Bhang (iskar.)	H.
Deer (barking).			
Dog.	Hun.	khi H.	shúna.
Elephant.	Host.	Thláng poeko.	H.
Fox.			H.
Goat.	Tsáwulm. <i>m.</i> Tsá- witch <i>f.</i>	Rah, (young) r- eu,	tsèli.
Hare.			H.
Pig.	Saur.		H.
Horse.	Gúr.	s Tah.	H.
Rat.	Guggor.	Biúa.	mosha.
Sheep.	Hond, kât. <i>m.</i> Gobe. <i>f.</i>	Forong (mas.) Lú. (fem.)	H.
Otter.			gho.
Marmot.		Phúa.	H.
Calf.	boo.	Boo.	
Ibex.	kheyl.	skieu.	
BIRDS.			
Crane.			
Crow.	Káw.	Bérakh.	H.
Chikor.	.....	.....	chukkra.
Dove.	.....	.....	Gúgútú.
Duck.	Buttuck.	same as in Hin- dustani.	H.
Eagle.	.....	• biendokh.	gidz.
Hawk.			
Heron.			

<i>English.</i>	<i>Kashmiri.</i>	<i>Balti.</i>	<i>Remarks, Kishtwari, &c.</i>
Kite.	Gánt.		
Minah.	Hèure.	.....	H.
Moorgha. } fowl.	Kokúr.	Beapo.	P.
Moorghi. }	Kokr.		
Owl.	Rat mogul.	Tsunbiu.	H.
Paddy-bird.			
Parrot.	none.	.....	shúa.
Partridge.			H.
Pigeon.	Kotr.	Phúrgon.	alūm.
Quail.	Bátúr.		H.
Snipe.			
Red Teal.	Harowitch.		
Sparrow.	kantèr (m) Jsar f.	.....	H.
Chikor.		Strukpah.	H.
Magpie.		Kūshūp.	

INSECTS AND REPTILES— &c.

Ant.	Reh.	.....	bibli.
Bee, swarm.	Máshgūn.	.....	gun.
Bug.	.....	.....	tsur.
Butterfly.	Pomper.	.....	papri.
Caterpillar.	.....	pūtsabúrá.	lúri.
Centipede.	kunhèpin.	.....	shèutwal.
Earwig.	.....	.....	bourh.
Firefly.	Zuting.	.....	Dioli.
Flea.	Pish.	.....	prishù.
Fly.	mutch.	.....	H.
Frog.	Dūd.	.....	mandoo.
Grasshopper.	.....	.....	tit.
Hornet.	Túter.		
Leech.	Drúkr.	.....	jok.
Lizard.	.....	.....	Hiluli.
Mosquitoe.	Moitch.	.....	H.
Scorpion.	Bich.		
Snake.	Surí gonda—gúnūs,		
	f.		
Silk-worm.	Potkiom.		

English.	Kashmiri.	Balti.	Remarks, Kishtwari, &c.
„ chrysalis.	Potguti or guch.		
„ moth.	Pomper.		
„ eggs of.	Biote, lit. seed of.		
Spider.	Zuller garh.		
Tadpole.	Wátil Gad.		

Tick.	Chichiri.
Worm.	kiom.
Bumble-bee.	Bámber.
Snail.	kaingao.

FRUITS AND GRAIN.

Apricot.	tsèrer.	Chúli.	H.
Apple.	Tsoont.	Kúshú	H.
Almond.	Bádum.	.....	H.
Grape.	Dúteh.	újgun.	dakh.
Aniseed.			
Bran.	Kúsh.	.....	Kandú & shodh
Cherry (white.)	Glás.		
Do. (blackheart.)	Otchi.		
Barley.	Wúshkè.	nūs	H.
Greengage.	Eúre.		
Hazel nut.	Virièn.	.....	oormúnieor.
Indian corn.	Mūkoi.	Kútehúlisha	Kúkri.
Limés.	.....	.....	H.
Linseed.			
Melon (water.)	Hendwun.	.....	H.
Mulberry.	Tút.	osè	H.
Pear.	Tūng.	meuti.	ali tung.
Plumb.	Ash otche.		
Peach.	Tsú.	.....	H.
Poppy seed.	Būm.	.....	P.
Quince.	Būm.		
Rice.	Dhan.	.....	H.
Do. (husked.)	Tomūl.	.....	H.
Do. (boiled.)	Bhatūr (buttoo).	.....	rinia

<i>English.</i>	<i>Kashmiri.</i>	<i>Balti.</i>	<i>Remarks, Kishtwori, &c.</i>
Do. (chaff of.)	Toh.	.....	Shod.
Walnut.	Dúne.	stargah.	achole.
Water Lily. } Red Lotus. }	Pom Posh.	.....	none.
Eatable seeds } of ditto. }	Pom lokr.	.....	none.
Root of ditto.	Nuñr.		
Wheat.	kúmikh.	kro.	P.
„ a pyramidal } shaped grain. }	Tromber.	.....	Dran.
Singara nut.	Gayr.	.....	none.
Peas.	.....	pokstrun.	Krao.
the seed of do.	.....	strunma.	H.
the pod of do.	.....	isganboo.	
Mageet (dye.)	.....	tsút.	H.
a purple pum- } elo on hills. }	.....	Gangpoondar.	
Melon (sweet.)	kūrbooz.		
Strawberry.	ingeroche.		
Morelle, a kind of toad-stool.	kundgúteh.		

NATURAL OBJECTS, PHENOMENA.

a descent.	.....	.....	oorwali.
Bank of a river.	Bhút.	Chúsna.	
Bog.	Numbul.	.....
Brook.	Khol, Ará.	r Yamtso (tsun- tsê) little.	gud
Cave.	Gop.	.....	gal.
Cliff.	Chumb.	.....	mutti Kurwali.
Comet.	Lèt dhar tarook.	skarmah-zhuk- ring, (behind long.)	
Dale or valley.	Nai.	.....	nali.
Forest.	Wan.	Bow. Hind.	H.
Fissure in ice.	Hoi.	sezgah.	
Glacier.	Gūnj, Tilkūtr.	Ganse-Gang.	sorh.

<i>English.</i>	<i>Kashmiri.</i>	<i>Balti.</i>	<i>Remarks Kishtwori, &c.</i>
Hill, mountain.	Bál	Rhi, peak high, dong-tonmur. rhi, Peak low.	
Island.	dhaim.	tok.	
Lake.	Sur.	Tso	H.
Moon.	Zún.	T. Sok.	H.
Do. new.	tsünder.		
Pass.	Gul.	La-Luggo.	gulli.
Spring.	Nag.	chú mikh.	nag.
Star.	tarook.	skurmah.	H.
Sun.	Aktab, Doh.	doh kool, rising. doh loos-nima, setting.	Dise.
Stone.	Koin.	r doah.	gorh.
Tree	Kúl.	.....	búth.
Wind.	Wao-push.	Klung.	báth
Wood.	Zieune.	shing.	tsoria.
Quicksand.	.....	Bia tsup.	
Air	Wan.	.....	chonkar.
Water fall.	pausader.	Chúpiar.	
Rain.	nai (in Wurdwan).	thl Tong.	city.
Cloud.	Oboor.	Múnpah (mun mah.)	H.
Dawn.	.....	.....	rot biani gya.
Dew.	Laùè.	.....	trèli.
Eclipse.	Gránmüt.	Rás.	H.
Fire.	Túngl-nar.	mèh. ॐ	H.
Flame.	Reh.		
Fog.			
Frost.	soor dog.	Báugrho.	kukr.
Hail.	Doat.	Zerburuse, Zer- buroze.	hushn.
Ice.	Yukh.	Ganse.	sorh.
Lightning.	Woozmul.	Trut, that that strikes—Brúk tsurk.	
Rain.	Rood.	Numker (out falls).	rodh.

<i>English.</i>	<i>Kashmiri.</i>	<i>Balti.</i>	<i>Remarks, Kishtwari, &c.</i>
Rainbow.	Ram Ram Bhún.	Tser.	Ram Dhun.
Rainy season.	.....	.....	H.
Smoke.	Dú.	Tutpah.	Dhūm.
Snow.	shín.	Káh.	shin and Him.
Thunder.	Gugrari.	Bosut.	gulkutha.
Avalanche.	.....	Rút.	Himán.
Ashes.	soor.	.....	booi.
Water.	... ..	choo. ཇུ	H.
River.	.....	r Yamtso.	H.
Heavens.	.....	khnum.	ambur.
Earth (quake).	.....	Tseh—tsa-gúl.	
Valley.	.....	Loombah Brok.	
Chaugau.	.....	Shagrun.	
a mat roof.	wüggoo.		
Arch.	.....	.....	none.
Boat.	nau-Dúnga.	Báhtz—naiyo.	none.
Brick.	seèri.	bakboo.	H.
Do. kiln.	.....	.....	awur.
Bridge.	kudl.	Zamba.	H.
Custom-house.	gúzürwan jagati.	Lampa.	H.
Ferry.	kurnau.	.....	H.
Fort (Bastion.)	killee.	khurh Piu.	H.
Ghaut.	yárbul.	.....	H.
Granary	koot.	.....	Deense.
„ of bees.	maush gūn.	.....	gūn.
House.	Lurhi, nūns.	nang.	H.
Tool.			
Lime kiln.	.....	.....	pūtti.
Mine.	Cop.	same as Deu, cave.	
Embankment.			
A necessary.			
Road.	Wát.	fr. Bál-Saus.— lam ལམ	Bath.
Shop.	Wán.	.....	hutti P.
Village.	Gam.	jong.	H.



<i>English.</i>	<i>Kashmiri.</i>	<i>Balti.</i>	<i>Remarks, Kishtwari, &c.</i>
Wall.	Dos.	angun.	
Flagstaff.	Alum.		
Rope Bridge.	zampa.	chúg zung.	kherh.
COLORS.			
Black.	krúhún.	Napo.	H.
Blue.	.....	súünpo.	H.
Brown.	Toos.	khodrüng.	H.
Light brown.	Badami.	.....	H.
Green.	Zanger.	tse rung.	H.
Red.	Wuzl.	Mapo.	H.
Yellow.	.....	Tserpo.	H.
White.	Chut.	Karpo.	H.
METALS, &c.			
Iron.	.....	chűks.	H.
Brass.	Sartal,	Bremarús.	H.
Gold.	.....	ser.	H.
Silver.	.....	khmúl.	H.
Copper.	.....	zangz.	H.
Bismuth.	.....	Tsullè.	
Bronze.			
Tin.	.....	.....	none.
Lead.	.....	moordo.	yarsoo.
VEGETABLES &c.			
Root.	Moule,	.....	Zil.
Leaf.	Pan.	.....	H.
Fruit.	mewur.	.....	H.
Bark.	.....	.....	shiker.
Blossom.	posh.	.....	H.
Beans.			
Brinjal.			
Cabbage.	krüm.	.....	kurm.
Chillies.	müritch wangün.	.....	pipli.
Cucumber.	.....	.....	H.
Fern.			
Garlic.			
Gourd.	kasheri alòr.		

<i>English.</i>	<i>Kashmiri.</i>	<i>Balti.</i>	<i>Remarks, Kishtwari, &c.</i>
Gram.	.....	.....	H.
Mushroom.	Hendor.	.....	none.
Mustard.	Tilgogul-Sünzer.	.....	shūria.
Onion.	perau.	Tsong.	H.
Peas.	kūrrer.		
Radish.	Múji.	.....	H.
Tomata.	Oor wangūn.		
Turnip.	Gogagi.	.....	tukm.
Kuddoo.	Alèr.		
Baugun.	Wangūn.	.....	būthè.

DISEASES.

Abscess or Boil.	Phepher.	mendok.	phimi.
Ague.	.....	dūrboo.	sheeth.
Cholera.	tupaile.	chús.	daki see vomí.
Cough.	tzás.	coughz.	khung.
Dysentery.	Duster.	chús.	
Fever.	Zál.	tap.	táo.
Gonorrhœa.	.....	.....	rogh.
Hiccough.	Hikh.	oph.	hiki.
Insanity.	.....	skaumet.	tsul.
Itch, itching.	kushun.	kúoh.	kashan.
Leprosy.	... ..	shipiri.	H.
Freckles.	Müchtedji.	.....	jogūn.
Rheumatism.	.....	klúng.	
Small Pox.	Shitūl.	.....	H.
Do. (the mark Shitūl ok. of.)		.....	H.
Vomiting.	kai.	Sun ma net.	daki.
Wart.	.....	.....	mushwu.
Wound.	.....	makha.	H.

FEASTS, &c.

after 90 days.

Nao roj.

till 90 days. r Bier hùn kùn.

the next 90 days. assūt.

— 90 „ mēzau.

{ about 1st Augt. River Indus
is at it highest about this
time.

*English.**Kashmiri.**Balti. Remarks, Kishtwari, &c.*

TOOLS, IMPLEMENTS, &c.

Adze.	Tor.	Stew.	tongra.
Anvil.	Yērūn.	Twá.	árūn.
Axe.	mükküz.	Tsèrè.	H.
Basket.	Phote and puthdúr.	kari.	H.
Comb.	kūngain, for women.	kūngo, for men.	H.
File.	Phárowar.	.....	áwai.
Saw.	Littler.	arah.	H.
Harrow.	.....	.....	dah.
Hoe.	Rumbè.	chiukse.	gúnderi.
Hone.	Billo.	o derh.	pulli.
Knife.	Shrák.	Gri.	H.
Ladder.	Hare.	.....	H.
Loom.	Dhor.	Tüsgün.	küddi.
Mould.	kálib.	.....	külboot.
Needle.	Sütz sün.	küp.	sünhau.
Oil Press.	Lilwein tsok.	.....	kolū.
Pincers.	Shirūnj.	.....	útser.
Plough.	hulbain.	Tawit.	H.
Razor.	khore.	Go brokti gri, lit.	chore.
		head shaving	
		knife.	
Scissors.	mekraz, dukore.	Dugar.	dúkhri.
Scabbard.	káti.	shúp.	H.
Sickle. } Drauti. }	Drought.	Zorbah.	Dranti.
Spade.	Liwün.	.....	Bungori.
Thimble.	nyit.	Tsen shúp.	H.
Umbrella.	Tapdan.	Nien tzúne.	chūtri.
Wedge.	.....	.....	putti.
Yoke.	Yipüt.	.....	jun.
Oar.	khoor.	.....	none.
Rope.	.....	Thūkpa.	Raz.
Flute.	nai.	piathling.	bensri.

<i>English.</i>	<i>Kashmiri.</i>	<i>Balti.</i>	<i>Remarks, Kishtwari, &c.</i>
Hammer.	Dokker.	Tūkchoong.	hathora.
Flint and steel.	.....	chūmūk.	rúnka.
Charcoal.	.....	Tsulbah.	angar.
Bellows.	.....	Zwúpah.	
the melting	.....	Lūskonsh.	
spoon used by			
sonars.			
Raft of skins.	.....	Zūkhse.	
Large scissors	.....	Angútzhè.	
used by sonars.			
Drill (Balti).	.....	Tsoras girri.	
Khilta, a basket	.....	chirong.	khara.
caried on back.			
The ropes of do.	.....	thukpah. ཐུག་པ་	kutchā.
Trumpet.	.....	Sunah.	H.
Rake.	.....	Brashing.	
A thrashing spot khal.		kieule.	khūl.
for the bul-			
locks to walk			
round.			
The pole in the	.....	kieule shing.	
centre of.			
Sling.	.....	Horhdo.	{ none is used in Kashmir.
APPAREL, ORNAMENTS, &c.			
Bracelet.	kor.	kūngūn.	
Cap.	.....	Nuting.	{ made of cotton cloth, Taki.
Coat.	.....	Gonmo.	H.
Gloves.	.....	Lukshoop.	H.
Handkerchief.	athè dudj.	.....	H.
Ring.	Warj.	surúp.	H.
Churi (small	Búnger.	odú.	H.
bracelet.)			
The long Kash-	Phèrun.		
mir coat, both			
men's and			
women's.			



<i>English.</i>	<i>Kashmiri.</i>	<i>Balti.</i>	<i>Remarks, Kishtwari, &c.</i>
The long sleeves to the women's coats.	koraba.		
Embroidered cap.	Orukh chin.		
The red head- band worn by the women.	kasaba.		
A stone with in- scription worn round the neck for grief on the departure of a friend.	Húll, dale.		
The chain orna- ment from the centre of fore- head to the ears.	Damin.		
Earring.	Kunè wuj.	.....	H.
Ladak shoes.	.....	Múshúk, pūbboo.	
Ornament worn on the should- ers by the Brokpah wo- men.	.....	Mellong.	
Broach.	naug chúngo.		

THE MONTHS.

January.

February.

March.

April.

May.

June.

July.

August.

.....

Matum.

September.



<i>English.</i>	<i>Kashmiri.</i>	<i>Balti.</i>	<i>Remarks, Kishtwari, &c</i>
October.			
November.			
December.			

DAYS OF THE WEEK.

Sunday.	Atwar.	Adi.	Ayth.
Monday.	Sonderwar.	Tsundral.	Asunder.
Tuesday.	Baunwar.	angáru.	Manguli.
Wednesday.	Bodwar.	Bodú.	Bodi.
Thursday.	Breswar.	Bresput.	Brèbut.
Friday.	Júma.	Shúgŭrŭ.	Shúker.
Saturday.	Bŭtwar.	Shinshèr.	Sŭncher.

DIVISIONS OF TIME.

<i>English.</i>	<i>Kashmiri.</i>	<i>Kishtwari.</i>	<i>Balti.</i>
Afternoon.			
Day.	Doh.	Di.	Chik-Zak.
Daybreak.		bŭraotera.	Nimasber (sunrise.)
To-day.	ādj.	az.	Dring ཅེ་འདི་ཉི་མ་
To-morrow.	pŭgga.	kalè.	Haské giukpa.
Day aftermorrow.	koilket.	treusè.	Snŭng.
4th day.		.....	..... atses.
Yesterday.	yown.	hiŭ.	
Day before yester- day.	autera.	hoterm.	
Evening.	koftŭn.	bialè.	Sham.
Midday.	pishŭn.	H.	pishine.
Midnight.	adhi rat.	adhrātha.	Sŭnpet.
Moment.		H.	Same as Hind.
Morning.	Subhŭn.	otera.	Giŭkspa, giokhpat.
Night.	rat.	H.	same as Hind. tsŭn.
Week.		ath-di.	ab Dhum.
Year.	wèri.	bŭri.	Lôkhor.
16 days.	pŭtch.		
10 o'clock A. M.			Muea thuse.
Month.		H.	Za.
3rd day in ad- vance.		tsotè.	

English. Kashmiri. Balti. Kishtwari, Remarks, &c.

MISCELLANEOUS NOUNS.

Abuse.	Leker.	kh Mun mo.	H.
Account.	hisab.	Same as Hind.	sitsi. lèker.
Act.			
Affair.	kār.		H.
Animal.	Jānāwār.	Beil song.	H.
Ball.	Gūile.	polo.	H.
Beak, bill.	Tonth.	kūmchū.	H.
Bit.		Strūp.	H.
Border.	kināre.	tangna.	kundèt.
Breakfast.	Nihère, koj.	Gios, pi, zan.	kūtūwar.
Bridle.	Lākūm.	Gothūr.	
Bundle.	Guth ther.	Būskia.	būchka.
Burden.	Bore.	kūr.	H.
Buying & selling.	Hyūn to kūnnūn.		H.
Change.	Soink.		biāje.
Coffin.	Sabood.	chirgos.	H.
Cost-price.	Mol.	Tsām.	H.
Ear of corn.	kunuk kihul.		Sila.
Kernel.	Goji.	r. Tsoo.	of walnut, Mūgrū; of apricot, gūli.
Pod.	Hembě.	H.	Shimi.
Seed.	Biote.		
Sheaf.	Loire.	the large, chūb, the small, kūshū.	
A well for grain.	.....	deeūs.	
Point.	piout	Tsonse.	
Thorn.	konde.	kanto.	Tsook.
Wood.	Zieūn.	tsori.	Tsing, shing.
Marriage.	Niètr.	H.	Bakstūn.
Thief.	Tsoor.	H.	kierkūn.
Wages.	Maujūb.	chimain.	Niakhta.
Depth.	Sone.	gath.	Khomboo.
Dinner.	khyūn.	H.	Gon phini zan.
Dust.	Lütz.	gūtta.	l. Dum l. dum.

<i>English.</i>	<i>Kashmiri.</i>	<i>Balti.</i>	<i>Kishtwari, Remarks, &c.</i>
Dung made up into cakes for burning.	Loor.	Not made into balls.	shlung.
Edge of sword.	Dār.	H.	Kussers.
Back of do.		H.	Tukspar.
Excrement.	Gūs.	H.	
Filth.	Mul.	H.	
Garland.	Māl.	H.	turmah.
Height.	Tuzzer.	kūrwali.	tonmoh.
Hem.	Pujirūn.	gèra.	tulli.
Lie.	Apas.	H.	zons.
Life.	Zū.	H.	strok.
Light.	Gāsh.	prugra.	sang.
Name.	Nas.	H.	ming.
Necklace.	hutèphūt.	The long kind, treminian.	phulloo.
Neighbour.	Humsai.	gowandi.	Hind.
Lodger, a liver in a house.	Wāngūj.	būswala.	
Noise.	Krèk.	H.	Skūt.
Plank.	Pūtchi.	pūkher.	
Purse, or small bag.	Sozheure.	basni.	
Large bag.	Gotz.	H.	
Rust.	Khaī.	H.	khyar.
Scent (bad).	Phak.	H.	Sri.
Shade.	Shūnl.	tun Dowar.	junphuk.
Shell (bivalve).	Kaw shup.		
Snail.		garèli.	
Snuff.	Nast.	H.	Naswars (Hind.).
Song.	Giouwan.	H. (thlieu.)	by women, heure wunensūn. Kash.
Span.	Pau.	grit.	chūbjhie kruksum.
Square.	Ssokūnjul.		
Stick.	Lour.	dhèsi.	
Summit.	tèn toll.	H.	
Tail.	Lote.	lènhun.	zhin doh.

<i>English.</i>	<i>Kashmiri.</i>	<i>Balti.</i>	<i>Kishtwari, Remarks, &c.</i>
Thread.	Pāu.	Daga.	skut puh.
Double.	Dow.-	Bute da daga.	
Torch of pine wood.	Lūshè.	Lūshi	
Width.	Khol, kūdjera.	billi.	phūlchūn.
Yolk of an egg.	Zūn, Korgieu.	Nuldia.	marpo, lit. yellow.
Luncheon.	.....	.....	fri zūn.
Saddle.	.....	Kati H.	izgāh.
Stirrup.	.....	H.	Epchūn.
Whip.	.....	Korara.	Thūr.
Martingale.	.....	.....	Blantūk.
Gūlēl.	Reenz.	H.	Liaug gong.
Bow.	.....	H. Dhaon.	Zhū
Arrow.	.....	H.	Dah.
Grave.	.....	.....	Mūzer.

NAMES OF TREES, &c.

Tree.	Kūl & Kūdge.		
Bokine.	Drèk.		
Rose.	P.	meudok	H.
Walnut.	Dhūnkūl.	.....	H.
Poplar.	Prūsth kūl.		
Apricot.	Tsèr kūl.		H.
Birch.	Boorjè kūl.		
Pinus longifolia.	Khyer.		
Horse chesnut.	Wun dhūn.		
Elm.	Bren.		
Willow.	Wheer.		
Plane.	Booin.		
Pear.	Tang kūl and nāk kūl.		
Apple.	Tsoont kūdge.		
Mulberry.	Tūl kūl.		
Almond.	Bādūm kul.		
Cherry (white hard.)	Glass kul.		
Pomegranate.	Dharn kul.		
Vine.	Dutchiranth.		

English. Kashmiri. Balti. Kishtwari, Remarks, &c.

MISCELLANEOUS ADJECTIVES.

Above.	.....	Kure.	
Aged.	Pūrone.	H.	Sningmah.
Alone.	Kūnezun.	H.	
Angry.	Tsāk.	nosh.	Kaunse.
Bad.	yetch.	kutchā.	shishik.
Best.	Sarè kote jān.	roli.	
Big.	Bod.	H.	Chogo.
Bitter.	Tient.	ambül.	
Black.	Krihūn.	H.	
Blind.	one.	H.	"Kone," blind of one eye, gserbah.
Blue.	meul.	H.	
Blunt.	monde.	moger	
Cheap.	Log.	H.	Eūntsè.
Clean.	Jaf.	H.	same as Hind. kūrpo.
Cold.	tūrn.	H.	
Crazy.	matūmūt.		
Cross.			
Dark.	Airogūto.	andero.	
Deaf.	Zor.	zerro.	Ghūt.
Dear.	Drog.	H.	Inotpo.
Dear.	Fort.	nayr.	
Deep.	Sone.	.....	Ghūlong.
Dirty.	mūlūn.	H.	Trima.
Dizzy.	Gieūr.	gèra.	
Dry.	Hok.	.....	H.
Dumb.	Kot.	.....	lütter.
Easy.	Sahul.	.....	H.
Empty.	Chonè.	.....	binghi.
Every.	Herks.	.....	H.
Exact.	.....	.....	H.
Few.	Maunè.	.....	H.
Fine (like flour.)	Zaiwül.	.....	P.
Firm.	Dūrh.	.....	P.
Fit.			

<i>English.</i>	<i>Kashmiri.</i>	<i>Balti. Kishtwari, Remarks, &c.</i>
Flat.	.....	"Pudri" in hills near Kishtwa.
Good.	Jān-wāri	..... rola.
Hard.	Dūrh.	..... P.
Heavy.	Gob.	Cho. H.
High.	Jodh.	Thūnmo.
Lame.	Longue.	..... tonta.
Last.	Poth.	..... pūtta.
Late.	.....	..... tūdha.
Lazy.	Shūst.	..... hul, hak.
Lean.	Tūn.	..... H.
Least.	Sarè kot lokut.	
Left.	Khown.	..... H.
Light.	Gash.	
Light(in weight.)	Lūt.	Yāmo. lokf.
Long.	Zient.	ringmo. H.
Loose.	Dieul.	..... H.
Low.	Kūmih tode.	lit. little high. urè.
Many.	Sutta.	..... P.
Moist.	Oder.	..... aderi.
Near.	Nizeek.	nè more. P.
New.	No.	..... H. nawè P.
Next.		
Old.	puraun.	..... H.
Pure.	Shütz,	When water is very pure. nitlolusha.
Rapid, quick.	Tikan.	.....
Raw.	Aum.	..... H.
Red.	Wūzūl.	..... H.
Right (hand.)	Dutchen.	..... H.
Right.	Poz.	..... H.
Same.	Barabud.	..... H.
Short.	Tsot.	..... H.
Slow.	Lūt.	..... lokè.
Sly.	.....	..... H.
Small.	Lokūt.	Tsūntsè. H.

<i>English.</i>	<i>Kashmiri.</i>	<i>Balti.</i>	<i>Kishtwari, Remarks, &c.</i>
Sour.	Tsok.	.....	H.
Stiff.	Dürh.	.....	H. P.
Stagnant.	Heunür.		
Sweet.	Mient, modur.	.....	H.
Tall.	Zieul.		
Steep.	.....	.....	kurwali.
Near.	.....	nèmore.	
Thick.	Vient.	.....	thoola.
Thin.	Thow, zaical.		
Warm.	Gürm.	.....	Tutta P.
Weary.	Loos.	Klüt.	hulpak.
Wet.	odür.	.....	aderi.
White.	Chot.	.....	Chiter P.
Wise.	Dana.	.....	H. Siaua.
Handsome.	.....	Güşa.	rola.
Ugly.	.....	Shishik.	asūngo.
Broad.	.....	phūlpo.	
Enough (bus.)	.....	Tsūt.	H.
Far.	.....	taring.	H.
With.	.....	chūk.	H.
Of.	.....	i like in Persian.	
By, from.	.....	eyna.	
To.	.....	la.	
In.	mūuz.	bing.	
Into.	.....	na muru, skil.	H.
Upon.	.....	tok tu.	purh.
Above.	.....	Goma.	
Below.	.....	Gomba.	ordi.
I.	ba.	nga.	aon.
Thou.	.....	kiang.	tuí.
He.	.....	lo.	uh.
We.	.....	.....	aon.
Ye.	.....	yang.	tu.
They.			
To me.	mènusè.	Kong, òong.	uh.
Hot like pepper.	.....	.....	Tutta.



<i>English.</i>	<i>Kashmiri.</i>	<i>Balti.</i>	<i>Kishtwari, Remarks, &c.</i>
Who.	kous.		
Mine.	miown.		
Up hill ascent.	küssün.		
Down hill descent.	wüssün.		
Mine, of me.	maini-maino.		
Yours, of you.	túni.		
To me.	mi.		
From me.	aonda.		

VERBS.

<i>English.</i>	<i>Kashmiri.</i>	<i>Balti.</i>	
Come.	Infin. wulsè	ong.	
Go.	gütz.	tsong.	
Bring.	au.	khiong.	
Take away.	heth gütz.	kerh.	
Take hold.	nũthen.	ching.	
Give.	diss.	min.	
Get away.	.....	lokse song.	
Speak.	dèpeo.	zerh.	
Put.	thao.	yok (hard).	
Make.	.....	biose.	
Wipe.	.....	trut.	
Sew.	.....	trũp.	
		tzũn set.	leg gia.
Sing.	.....	tong.	

NUMERALS.

<i>English.</i>	<i>Balti.</i>	<i>Kashmiri.</i>	<i>Ladaki.</i>
1	chick.	ak.	
2	nis.	zũ.	
3	jsũm.	trè.	
4	bijhi.	tsore.	
5	ghũa.	panse.	..... lũa.
6	jrũk.	shè.	
7	abdhũn.	sat.	
8	ab ghiet.	ought.	
9	r goo.	nau.	

<i>English.</i>	<i>Kashmiri.</i>	<i>Balti.</i>	<i>Remarks, Kishtwari, &c.</i>
10	chu.	dah.	
11	chūschick.	kah.	
12	chūnus.	bah.	
13	chūksūm.	trèwah.	
14	chūgjie.	tsodah.	
15	chūga.	pandah.	
16	chūrūk.	shorah.	
17	chūkdūn.	satdah.	
18	chughiet.	ardah.	
19	churgoo.	kūnwuh.	
20	nishoo.	wūh.	
21	nishoo chick.	ak wūh.	
22	nishoo nis.	zū towūk.	
23	nishoo Tsūm.	tro wuh.	
24	&c.	tso wuh.	
25	&c.	poon tso.	
26	.....	shè wuh.	
27	.....	sata wuh.	
28	.....	ato wuh.	
29	.....	kūno tru.	
30	.....	trū.	
40	nishoo nis.	tso wuh.	
50	ghabehū.	pausa.	
60	nishoo tsūm.	shèth.	
70	abdūm choo.		
80	nichoo jhi.		
90	r goop chu.		
100	abgya.	hath.	
1000	stonchick.	sās.	
1st.	gopa.	godmieuk.	
2nd.	gopi shūl.	do yūm.	
3rd.	skilpa.	trè yūm.	
4th.	jhupa.	tsū yūm.	
RELATIONSHIP.			
Father.	Atah.	Bab-maul.	Bab.
Mother.	Aoigo.	mauj.	Mali.



<i>English.</i>	<i>Kashmiri.</i>	<i>Balti.</i>	<i>Kishtwari, Remarks, &c.</i>
Brother.	Ming mo.	Boy.	H.
Sister.	String mo.	Bhènyè.*	*H.
Grandfather.	Apo.	Bod bab.	
Grandmother.	Api.	nain.	
Great grand- father.	Nespo.	.....	Purdada.
Great grand- mother.	Assi.		
Uncle, } father's	Atah tsūnstè.	pitr.	H.
Aunt, } side.	Ango tsūnstè.	pope.	
Uncle, } mother's	Momo.	mama.	Masi H.
Aunt, } side.	Nènè.	mos.	
Cousin, father's side.			
Cousin, mother's side.			
Brother-in-law.			
Sister-in-law.			
Daughter.	.....	.....	Kuri.
Son.	.....	.....	Mutter.

<i>Hindustani.</i>	<i>English.</i>	<i>Kashmiri.</i>
Adim.	man.	mauneo.
Awrāt.	woman.	zenanah.
Lurka.	boy.	netchu.
Lurki.	girl.	koor.
Ghorah.	horse.	goorh.
Bukerie.	goat.	tsawitch.
Gudda.	donkey.	kher.
Bungala.	ditto.	lerh, nuno.
Pahar.	mountain.	koh.
Kishtee.	boat.	nāo.
Pani.	water.	tresh.
Ag.	fire.	tongue.
Burf.	snow.	sheen:
Tunda.	cold.	tur.
Gurm.	hot.	gurm.

<i>Hindustani.</i>	<i>English.</i>	<i>Kashmiri.</i>
Hawa.	wind.	wās, push.
Menth.	rain.	rōōd.
Durwaza.	door.	birh.
Khana.	food.	kyūn.
Mukkun.	butter.	thein.
Dud.	milk.	dōūd.
Lukerie.	wood.	dtzun.
Gosht.	meat.	marz.
Sir.	head.	kulla.
Ankh.	eye.	outch.
Nākh.	nose.	nust.
Mou.	mouth.	bhut
Jebh.	tongue.	zeān.
Dant.	tooth.	daud.
Hath.	hand.	hathé.
Gulla.	neck.	hoth.
Honth.	lip.	wooth.
Bāl.	hair.	must.
Murghi.	fowl.	kokr.
Undea.	egg.	tool.
Miseri.	sugar.	mishere.
Ata.	flour.	ought.
Choul.	rice.	tomul.
Bhat.	rice, boiled.	buttoo.
Lussi.	butter milk.	gūrus.
Guncher.	name of a fruit growing on the Burhan hill.	
Burton.	dishes.	bān.
Chūt.	roof.	wuggoo.
Derkhut.	tree.	kūl and kūdge.
Bhains.	buffaloe.	mārsh.
Poule.	bridge.	kuddle.
Rasta.	road.	wath.
Puttur.	stones on a road.	kyēm.
Toro.	break.	zāmun.
Samuk.	snail.	kaingao.

<i>Hindustani.</i>	<i>English.</i>	<i>Kashmiri.</i>
Tokri.	basket.	puthur.
Phul.	flower.	posh.
Atcha.	good.	jan wari.
Karab.	bad.	weh.
Mota.	fat.	orqut.
Putla.	thin.	thin zaiwul.
Kutta.	sour.	tsak.
Chota.	small.	lokut.
Burra.	large.	boddur.
Ghaira.	deep.	sún.
Uterai, chirai.	.....	wussun, kussun.
Lal.	red.	wuzl.
Kala.	black.	kzoohum.
Sufed.	white.	chuth.
Subz.	green.	subz.
Nila.	blue.	niewl.
Tang.	narrow.	tzoom.
Upur.	above.	nure.
Nechi.	below.	bhim.

NAMES OF TREES.

Chir.	<i>Khyer.</i>
Horse Chesnut.	Wun dhun.
Um.	Bren.
Strawberry.	ingeroche.

ba chusus laiyun.
 ba sa qutzo.
 ba sa chus.
 kous sa chus.
 wulza ! tikāns.
 kyasa kom ché ?
 tzor rupeiya wusme.
 menus é chemina.
 meown pyala anso.
 ānsō ! tikan.
 antisa ?

hum marté hyn.
 hum jaté hyn.
 hum hy.
 kon hy ?
 jaldi ou !
 kya kam hy ?
 chahor rupeya udā do.
 hum ko nahin hy.
 humara pyala lao.
 lao ! jaldi.
 layā hy ?

chā dissā tikāu.

Hūtso.

Thrēsh chēso.

myou■ kāt bozen.

kya suzā.

wūtzo.

dūpsa.

bē diesah.

eu dissah.

bé ne sa chuna.

cha do juldi.

lé lo.

Pani peeo.

humara bat sunno.

whas faule.

utao.

bolo.

aur do.

idher do.

aur nahin hy.

Pani menh barasta.

,, barasa.

,, barasenge.

,, barasna Im.

rood wálan.

,, walen.

,, pugga walèn.

,, wal

marna.

marta.

mara.

marenge.

maro.

loyun.

am loynum.

pussa lāye.

lāyus.

jana.

jata.

gya.

jaenga.

jao.

gūssun.

gao.

pugsa gūtza.

gütz.

bolo.

bolta.

bola.

bolènga.

wanus.

wanan.

wonum.

wūnnūs.

rukho.

rukhta.

rukha.

rukhèngi.

thas.

tawun.

thawūm.

thanwa.

Hindustani.

1. Kit na beehta seb?
2. Ab tum kahan se ata hy?
3. Hum Kashmere se ata hy.
4. Us killa men kya hy?
5. Ab kahan jate ho?
6. Kurra raho, seb dekhlo.
7. Yih sub krāb hogya.
8. Hum denge rūpee 100.
9. Tumara nam kya hy?
10. Idher ou.
11. Wahan jao.
12. Wahan āo.
13. Humko bosa do.
14. Under lao juldi gaong se.
15. Hum léaungen.
16. Is gaongmen, gosht milta hy.
17. Kitna dam hy?
18. Tum hy burra jut wallah.
19. Hum itna dam nahin dengén.
20. Kuffer mut jao.
21. Dhoop bāhoot gurm hy.
22. Hum bolta thoré.
23. Ab hum sikta hyn.
24. Ag jalao, cha banao.
25. Kitna dur hy Srinugger?
26. Kishti kyncho juldi.
27. Isturf kuch shikār?
28. Purdah utāo.
29. Wuh pind kya nam hy?
30. Yih pergunnah kya nam hy?
31. Us pind men kitna ghar hy?
32. Dereow ke par.
33. Rusta atcha hy ki nahin?
34. Us pahar tuluk rusta chunga hy?
35. Us se lè lo lui.

Kashmiri.

- Kutz kan auzu isoōut?
- Whin zu Kate pet āk?
- Ba Kashere peta ās.
- That Viltatus audur kyachu?
- Whim kotzu gutzuk?
- Wuddeni roj tsoont hāo.
- Yhim sāra yeteh qyee.
- Bāh demai rupee hath.
- Cheun nāow kya chu?
- Yuree wul.
- Hoar gutz. Pronounced after Yoar.
- Hoar wullo.
- Moein dunzè.
- Tool ān, tikān gāmen.
- Bāh āney.
- Yet gamus munz marz chē mēlen.
- Kot or kota mol chi?
- Tzu chuk bōd assas zor.
- Bā eut mol demai nē.
- Kuffur ma gutz.
- Tāp jutta gurum chu.
- Ba chus koshere bolen bumanni.
- Whim ba koshere hes chir chus.
- Nar zaloo chaè karo.
- Kōta chu dur bod sher?
- Nās pukno tikan.
- Yet kin kya shikar?
- Purdah tulso.
- Wuth gamus kya chu nā?
- Yet pergunnus kya chu nā?
- Wuth gamus kutz muns che?
- Dereon apār.
- Wuth che jān ki nah?
- Kohus tul wāth cha jān?
- Um, is nishè hè tsāder.



36. Hum kul nishān ko jaengèn. Ba gutzo pugga nishames pet.
 37. Tum kul gyà nishān ko. Zu yo gya nishames pet.
 38. Us ko do 3 pice. Hum is di trè pice.
 39. Wuh admi aur nahin milenga. Humus mauneo mèleu nè bè.
 40. Stand is jugah per rukho. Yeth jae pet māu stand.
 41. Sidha nahin hy. Seud chu nè.
 42. Zara is taruf, zara ūs taruf. Yeth kun bèhun yè porkun be hun.
 43. Ab atcha ho gya. Whin go jān.
 44. Us turuf jas dekho ke nishan Hutut gutz wutch nishan chenuze-
 nuzr āta ke nahin. rey i kin nay.
 45. Is dereon men bahut pani hy, Yeth dereowus muns setta āb chus
 kahan us par lungègen. kut kin terow āpor.
 46. Kitna chaul bāki hy? Kota chu bè tomul?
 47. Annah ko kitna dèta. Kut di kāumes.
 48. Isa juth muth mut kaho. Yeutn apas mapas mè wun.
 49. "Jemāl me" ath seer tomol Jemāl nur ath seer tomul meulis.
 mila.
 50. Wuh sirf 3 sir mila. Fakut mèlis trè dir.
 51. Wuh admi kyun rota hy? Ho mauneo kya zè wuddān?
 52. Kissè shuks ne uskè lui lè gya. Kumtain shuks umsams nee yè
 tsadur.
 53. Yih lukerie bigi nay julta. Zun che odōr duzān chu neu.
 54. Yih lukerie sukhi julta. Yè zeun chè huk duzān.
 55. Is ghar khūb būna hūa. Yeth ghrus zubr chè lodmut.
 56. Das burus hua. Dah whèri gyi.
 57. Wazier zerawur hukm dya, tub Wazier j hukm dit mok tūn adgo
 sadak ko gya, aur wahan mar sadak ad zunuk tata marut.
 dala tha.
 58. Hum log Kashmir se aya Asigyi Kashiri am tin go zu ryut
 12 din. bah doh.
 59. Deres lung jata hum log ko. Asi luge ak doh apoe tūrienus.
 60. Kanah pukka hy, ki nahin? Khyun ronui ki, nè nay?
 61. Khana kahega. Khyun khèmau.
 62. Burtun lèjao. Bāu neh.
 63. Humara pyala lè yya. My oun pyāla nyun.
 64. Hum wahan jaengèn. Ba gūsi hore.
 65. Tum atcha hy. Zu chūk wārè.



66. Wùh do zenani wahan biti hy Gim zū zenani che biyet kūm
kon hy. che ?
67. Tum kyun nay hukm mante ? Zakon chuk hukm manau ?
68. Tum jate ? Za gusuk ?
69. Hum jate. Ma gūsè.
70. Aur kya chaye ? Bè kya gutzi ?
71. Aur bolo. Bè iwun.
72. Humare hath gurm hy ? Nugoem hāthè gurm chè ?
73. Agr tum awaj kurtè, log sunen-Agr zu krèk tūlūk, log bozen ;
gè ; chup kuro. sūp kr.
74. Lung koun awenge ? Sūt kūsèdūm ?
75. Do manji nao lejao. Zu nauj ni sūt.
76. Utero kiste ko. Wussū nawè.
77. Tum nahin awenge. Za ik nè.
78. Burkha pahnèngè. Burkha aiman.
79. Idher hy phunsi. Qethè nūs chūm oeppor.
80. Anè janè dur. Ewūn gūsūn lūg dūr.
81. Bohat kujli ato. Sutter kūshun iwūn.
82. Beech jao. Munj pukku.
83. Barah pichi hy. Bah shè pūtta.
84. Dekho, wuh aurat kysa chulta. Wūtchu zinan kit pet pukkan.
85. Ghr per rukhunge. Lwu pet thauwun.
86. Kitna roj wahan rewhenge ? Kotzen dohen rojen thate ?
- 1½ seer = 1 munnut.
- 2 munnuts = 1 panzoo.
- 2 panzoos = 1 truck.
- 16 trucks = 1 kurwah,

NUMERALS.

1 ak.	10 dah.
2 zu.	11 kah.
3 tre.	12 bah.
4 tzor.	13 trouwah.
5 panch.	14 tzadah.
6 shéh.	15 pandah.
7 sat.	16 shewrah.
8 aughe.	17 suddah.
9 nau.	18 ardah.

19 kunoo.	29 kuntre.
20 wuh.	30 tren.
21 akwuh.	40 satagi.
22 zutuowuh.	50 panica.
23 trewuh.	60 sheth.
24 tzowuh.	70 satdu.
25 panchzu.	80 athdie.
26 shewuh.	90 naudie.
27 satawuh.	100 hath.
28 atawuh.	1000 sas.

Notes on Gupta Inscriptions from Aphasar and Behar.—

By Bābu RĀJENDRALĀLA MITRA.

Some time ago Major General A. Cunningham placed at my disposal, for translation, the transcript of a Sanskrit inscription from Aphasar, in the Behar district. It had been made over to him by the late Major Markham Kittoe, who had brought away the original "to re-examine and to restore it as much as possible, before having it fixed on a pedestal near the Varāha in Aphasar,"* but who, owing to ill-health and subsequent departure from India, could do neither. The original is no longer forthcoming. When General Cunningham enquired for it during his antiquarian tour in 1861-62, the people of Aphasar "were unanimous in stating that Major Kittoe had removed it to Nowāda for the purpose of copying it;" but no trace of it could be met with either at that place or Gya or Benares. The nature of the characters with which it was inscribed is not known, and, judging from the state of the transcript, it was not perfect, there being several lacunæ in the middle; but what remains of it in the transcript may be relied upon as authentic, having been prepared by Major Kittoe himself, whose thorough knowledge of Indian palæography is well known. The document has no date, but it is nevertheless of interest, as it supplies a list of Gupta sovereigns of Behar, hitherto unknown to antiquarians.

The first of this line of kings was Kṛishṇa Gupta. Nothing is said of where and when he reigned; but he is described as a man

* Ante Vol. XXXII. p. xxxviii.

of noble lineage, great learning, and uncommon firmness of purpose. He was succeeded in his dominion successively by his son Hashka Gupta and grandson Jívita Gupta, both of whom, in the hyperbolic language of the poet, were mighty heroes. The son of Jívita was Kumára Gupta, who waged war against one Čánta Varmá, and of whom the only thing notable is, that he "entered into a fire of dried dung as in a sea." The panegyrist does not explain whether this was done as an act of religious suicide, or merely as a penance, a part of the rite called Papechatapá. His son Dámodara fought with the Western Hunas at a place called Maushari, but evidently only to be killed, for the poet euphuistically notices his fainting on the occasion, and subsequently reviving under the touch of heavenly nymphs. Where this Maushari was situated, I cannot make out; nor can I ascertain the *locale* of a river or sea named Lauhitya, on the bank or shore of which hermits sang in praise of the king's son Mahásena Gupta. The last, after reigning for some years, left his kingdom to his son Mádhava Gupta. A gap in the inscription here leaves it doubtful whether Hashka Gupta, the name which follows, is that of the son of Mádhava or of a mere successor; and some others in a lower part of the record have rendered a great portion of the praises bestowed on Aditya Sena, the son of Hashka, quite unintelligible. What remains is of the usual unmeaning type, "unrivalled heroism," "universal dominion" and the like, which probably existed nowhere but in the fertile imagination of the poet. Aditya was a follower of Vishṇu, and the document records the dedication, by him, of a temple to the idol of his adorations. It notices also that his mother Mahádeví built a monastery for the accommodation of pious hermits, and his wife Kona Deví, with a keener eye to general utility than was owned by her lord and mother-in-law, had a large tank excavated for the use of the public. The engraver of the document was Sukshma Siva.

The names of the several princes of the dynasty may be tabulated thus:—

- I. Kṛishṇa Gupta.
- II. Hashka Gupta, son of I.
- III. Jívita Gupta, son of II.
- IV. Kumára Gupta, son of III.
- V. Dámodara Gupta, son of IV.

- VI. Mahásena Gupta, son of V.
- VII. Mádhava Gupta, son of VI.
- * * * * (?)
- VIII. Hashka Gupta, II. son of —?
- IX. Aditya Sena, son of VIII.

In the entire absence of data, it is impossible at present to determine the era of these princes, or the position they occupied in the history of ancient Magadha. There is nothing but the identity of the family name to justify the supposition that they were connected with the Guptas of the Bhitári Lát, but it is worthy of note that the latter, whose names are made familiar to us by coins and inscriptions found in Gházipur, Allahabad and Sánchi, did at one time extend their sway to Behar. The documents which enable me to make this assertion, are remarkable; they were found inscribed on a sandstone pillar lying in the Behar fort, and first brought to notice by Mr. E. L. Ravenshaw, in 1839. Mr. H. Torrens, then editor of this Journal, in publishing a translation of one of them, said, "I have now the pleasure of laying before the readers of the Journal a rendering of one of these (Behar) inscriptions as decyphered by Pandit Kamalá Kánta Vidyálañkára, and Bábu Hrambanáth. They succeeded in giving this interpretation after a great expense of time and labour. The characters are of a class not hitherto met with, and I confess I cannot submit this first attempt to interpret them, without considerable diffidence. The inscription is unfortunately destitute of both name and date, and does not, moreover, afford any clue by which the period of its record can be traced." According to the rendering published, the document contained a number of moral maxims, beginning with, "Be patient when angry. Perform religious sacrifices as prescribed. Be liberal in religious performances," &c., &c. The whole of this reading was, however, throughout imaginary, and the deductions made from it are, consequently, utterly worthless. Major C. Hollings noticed the inscriptions in 1860, and got a Pandit at Patna to decypher them for him. But his endeavours proved even less useful than the first. The worthy Pandit, in an elaborate translation, made out that the documents recorded the spot where king Jarásandha buried some fabulous amount of treasure which would be guarded by a dragon, until a European would come to bring it to light. The attempt

at imposition was so transparent in this instance, that it could not possibly be mistaken. Major Hollings, therefore, got a baked clay impression of the inscriptions prepared and sent to the Asiatic Society, in 1861. This at once showed that they were records of the Gupta sovereigns of Behar, and had nothing to do with moral maxims, or hidden treasure. An ink impression of the inscriptions was subsequently communicated to me by the Hon'ble Justice Sambhunáth Pandit. But it contained nothing that was not decypherable on the clay facsimile, and did not help me to add much to the tentative reading which I had already prepared. The accompanying plate is a reduced facsimile of the clay impression, and every letter on it has been carefully compared with those on the ink tracing. A copy of this plate was placed by me at the disposal of General Cunningham, and he had an opportunity of comparing it with the original during his Archæological Tour in 1861-62. The following is an extract from his report on the subject.

“One mile due east from the Dargâ, and about a hundred yards inside the northern gate of the old fort of Bihar, there lies a sandstone pillar which bears two separate inscriptions of the Gupta dynasty. Unfortunately the surface of the stone has peeled off considerably, so that both of the inscriptions are incomplete. The upper inscription, which is of Kumára Gupta, has lost both ends of every line, being probably about one-third of the whole. The lower inscription has lost only the left upper corner, and some unknown amount at the bottom, where the pillar is broken off. But as the remaining portion of the upper part is letter for letter the same as the opening of the Bhitari pillar inscription, nearly the whole of the missing part of the left upper corner can be restored at once. This record belongs to Skanda Gupta, the son and successor of Kumára Gupta.”

In the plate the upper inscription is numbered 1 and the lower one 2. The former extends to 13 lines and bears the name of Kumára Gupta whose eulogium it is perhaps intended to be. I say “perhaps” deliberately, for a large portion at the beginning of every line being lost, and it being impossible to give a connected translation, I cannot be certain that the record did not contain some other name which has now been lost. In the fourth line the word *Kavya* or “funeral cake” may refer to Kumára Gupta whose name occurs in the 3rd line, and the record

may consequently belong to Skanda Gupta, but in the absence of connecting words such a supposition cannot be justifiable. The document is most probably in verse, and the word Chandra in the first line suggests the idea that the Kumára Gupta of the record was the son of Chandra Gupta II. of the Kuhan Pillar. The figure for the year in the last line is perfectly clear, and is indicated, as usual in Gupta records, by three parallel lines, but the letters before and after it are very doubtful, and no reliance can be placed on the date. The letter preceding the 3 may be a 60, and some of the letters after the letter for S'aka may be figures, but I am not certain of their value. As Kumára was the sixth in a direct line from S'ri Gupta, the founder of the Gupta dynasty, it is certain that the date, whether 3 or 63, cannot be of the Gupta era, for according to the Udayagiri and the Sanchi inscriptions Chandra Gupta II. lived from 82 to 93 of that era. It must therefore be either of the reigning sovereign, or of some now unknown era other than that used in the Allahabad column inscription.

The second inscription is even more imperfect than the first, and has no date; but there is no doubt of its being an edict of the Gupta who recorded the Bhitari inscription, or of one of his descendants. General Cunningham imagines it to be a counterpart of the Bhitari record, and says that the portion extant "is letter for letter the same as the opening of the Bhitari pillar inscription." Such, however, is not the case. It is true, the first line has an epithet which occurs in the first line of the Bhitari inscription, and lines 3 to 12 are made up of words whose counterparts are seen in that record. It may also be admitted that Kumára Devi, the wife of Chandra Gupta. I, is named in the 5th line, and the word Gupta occurs in the 10th, which leave no doubt as to the race of the sovereign who recorded the document. But as no specific name is legible, and the words common to the two records are mostly adjectives expressive of royal qualities which are generally attributed to all Hindu sovereigns, their evidence cannot be accepted as conclusive as to the identity of the two records. Were it otherwise, still it would be of no use, for we have positive proof to shew that they are not identical. The second line of the Behar record has a word which does not occur in the first two lines of the Bhitari inscription, and the matter from the 13th line to the end,

if my reading be correct, is new. In the 18th line there is mention made of Bhaṭṭa Guhila Swámin, whose name does not occur in the Bhitari column. The conclusion therefore that I come to is, that the two documents were put up by the same race and very likely by the same king, but on different occasions, and to record different occurrences. There is nothing in the record to justify the positive opinion of General Cunningham that it belongs to Skanda Gupta, son of Kumára Gupta.

Translation of an Inscription from Aphasar.

There lived S'ri Kṛishṇa Gupta, a king, whose army was crowded by a thousand tusked, who was served by men of great learning, whose lineage was noble, and who was firm and ascendant as the mountain peak. His arms, which had overcome the ardour of numberless rivals, were even as those of the lion; for thereby he had pounded the bulging skulls of hosts of maddened elephants of his inveterate enemies.

2. Even as rose the moon from the ocean so from him descended a son, S'ri Hashka Gupta Deva, possessed of many digits, (arts,)* spotless and free from (the) clouds (of ignorance).

3. He was the holder of the hard-stretched bow which cared not for the fit time of death (for his enemies). He could pour showers of dreadful arrows, and was looked upon with tearful eyes by those who had been deprived of their homes, their wealth and their masters. His glorious success in fierce warfare was as it were recorded in his breast in the form of innumerable scars, as prominently and as indelibly as the perforations of insects in the knots (of trees).

4. His son was S'ri Jivita Gupta, the crowning jewel of kings, who was like the moon in the forest of water lilies represented by the faces of the wives of his murdered opponents.

5. The dreadful fever of his glory forsook not his adversaries, whether they sought shelter in the sea-shore washed by the waves of the water where dwell the pearl shells, and strewn over with stems of plantain trees cast around by the trunks of elephants which roam amidst lofty palms; or on the mountain top cooled by the water flowing from eternal snow.

6. This superhuman act of his—the leap from the shore of the

* The word in the original is *kalā*, which means both an art as well as the digits of the moon, hence applicable both to man and the moon.

sea where dwells all wealth, to the top of the Himalaya,—in chase of his enemies, is seen by mankind with wonder even to this day; it is like that of the son of Pavana (Hanumāna who spanned the Gulf of Manaar by a single leap).

7. That king gave birth to a son, even as did Hara to the rider of the peacock.* Forward in battle and of renowned strength, this son was named Kumára Gupta.

8. He, with a view to obtain Lakshmi, assuming the form of Mount Mandára, churned the milky ocean produced by the forces of the moon-like King Sánta Varmá,†—an ocean over which was spread a moving mass of waves (his soldiers) comparable to a line of plaitain trees put in motion by a passing wind, and in it were whirlpools formed of rising clouds of dust (raised by the soldiers), while the furious and mighty elephants (of his army) represented sunken rocks.

9. He was firm in truth and valour, and was engaged in the performance of ceremonies for the relief of the needy; he worshipped with the flower of truth. He entered into a fire of dried dung as in a sea.‡

10. Of that king S'rí Dámodara Gupta was the son. Even as Dámodara§ killed the Daityas; so did he destroy his opponents.*

11. While gloriously dispersing, at the battle of Maushari, the roaring line of elephants of the fierce army of the western Hunas, he fainted, and selected the nymphs of heaven (as his own, saying) they are "mine," and the pleasant touch of their lotus-like hands revived him.

12. That king gave away in marriage numberless Brahmin daughters of youth and beauty, bedecked with ornaments, and adorned with hundreds of necklaces.

13. S'rí Mahásena Gupta was his most valiant son. In all chivalric assemblies, he obtained the credit for noble heroism.

14. Hermits and their wives, lying on the cool shady banks of the

* Kártikeya, alias Kumára, god of war.

† The moon rose from the ocean when it was churned by the gods with a view to extract ambrosia from it. Mount Mandára, the backbone of the earth, was on the occasion used as the churning stick.

‡ It is not certain whether the author wishes to imply that the king burnt himself to death, or merely performed the penance called Panchatapá.

§ Yasodá the mother of Krishna, once kept him tied to a churn with a rope round his waist to restrain him from stealing butter; hence the epithet *Dáma*, "a rope" and "*udara*" "belly" or "waist." The exploits of Krishna with the Daityas sent by Kaúsa, king of Mathurá, to kill him, are well-known.

Lauhitya, with open beaming eyes, sang in praise of his wide-spreading fame,—that fame which was inscribed by the praises of his victory over S'ri Varmá, and which to this day is adorned by garlands of well blown wild jessamins and water-lilies, as with a necklace of moons.

15. Of him was born S'ri Mádhava Gupta, the highest essence of valour, even as Mádhava was born of Kámadeva. His two feet rested on the greatest heroes.

16. In war he was the foremost among the praiseworthy, and, as the receptacle of goodness and bestower of all he acquired, he was the greatest among the great. He was the family abode of wealth (Lakshmi), truthfulness (Satva), and learning (Saraswatí), and the steadfast bridge of virtue. There was none above him to respect, for he, the meritorious, moved foremost among the meritorious on the earth.

17. Like Mádhava (Kṛishṇa) he bore the sign of the thunderbolt on his palm,* and carried a bow made of horn; while the sabre by his side was for the destruction of his enemies, and the good of his friends. The jewel *Nandaka*.....

(About a dozen letters at the end of the line and over three-fourths of the next line are missing. Three lines then follow naming a Hashka Deva and his son Áditya Sena. Next, there are eleven lines, so full of lacunæ that no connected meaning can be made out of them: then the concluding line of a s'loka): his son, who owned the illimitable earth for his dominion, and was a protector of mankind.

In battle the two arms of the king shone resplendent, having ripped open the orbs of maddened royal elephants; the halo of his fame was lustrous with the glory of his numerous conquered foes; his feet rested on the heads of innumerable kings; the fire of his majesty was vast; fortunate was he, and in warfare pure and of renowned action.†

By that king, who in his attempt to make his noble and most wonderful Glory, which was as white as the light of the autumnal moon, and wide spreading as the earth, dwell with his Fortune,‡ had so irritated her that she, from a feeling of rivalry, went to live for ever

* An emblem of royalty according to Indian Palmistry.

† The word *idam* at the beginning of this sloka is not construable.

‡ In Sanskrit the words glory, *Kīrti*, and fortune, *Laksmi*, are in the feminine gender. The poet represents them as the two wives of the king, and then by a pretty conceit makes them quarrel from a feeling of rivalry and separate, Fortune, to live with her lord, and Glory, to go to the farthest limits of the earth.

beyond the bounds of the ocean, was this best of temples caused to be erected for Vishnu.

His mother S'rimatī Mahādevī caused a Maṭha or monastery to be built, and dedicated it, beautiful as a heavenly mansion, to the use of the virtuous. By the Queen S'ri Kona Devī, the beloved wife of the king, a beautiful tank was caused to be excavated. Its water, pure and lustrous, as if it were the picture of the white sea shell or the moon, was drunk by men and hermits—and in its flowing waves sported the jumping alligator and the dancing *timi* fish.

As long as the crescent shall adorn the forehead of Śiva, as long as S'ri shall dwell in the heart of Vishnu, as long as Saraswatī shall abide in the mouth of Brahmā, * * * * as long as the earth shall rest on the head of the lord of serpents,* as long as the lightning shall dwell in the womb of clouds, even so long shall king Aditya Śana shed around this spotless glory of his.

The thoroughly virtuous, and intelligent† Sukshma Siva Gaura engraved this eulogium in large‡ and artistic letters.

Transcript of the Apsar Inscription.

आसीदन्तिसहस्रगाढकटको विद्याधुराध्यासितः
सदंशस्थिर उन्नतो गिरिरिव श्रीछण्णगुप्ते नृपः ॥
द्वारातिमदान्धवारणघटाकुम्भस्थलीः चुन्दता
यस्यासङ्घुरिपुप्रतापजयिना दोष्णा नृगेन्द्रायितम् ॥ १ ॥
सकलः कलङ्करहितः चततिमिरसोयधेःशशाङ्क इव ।
तस्मादुदयादिसुतो देवः श्रीछण्णगुप्त इति ॥ २ ॥
यो योग्याकालहेलावनतददधनुर्भूमिवाणौघपातो
मूर्तेः स्वस्वामिलक्ष्मीवसतिविमुखितैरीक्षितः सांश्रुपातुम् ॥
घोराणामाहवानां लिखितमिव जयं स्नाय्यमाविर्दधानो
वक्षस्युद्दामशस्त्रत्रणकठिनकिण्णग्रन्यलेखाच्छलेन ॥ ३ ॥
श्रीजावितगुप्तेभूत् क्षितिशूडामणिः सुतस्तस्य ।
यो हृष्टवैरोऽनारोमुखनलिनवनैकशिशिरकरः ॥ ४ ॥
मुक्तागर्भपयःप्रवाहशिशिरास्तुक्कृतालीवन-
धाम्यदन्तिकरावलूनकुदलीकाण्डासु वेलासपि ।
स्थोततस्फारतुषारनिर्भरपयः शोतेऽपि शैले स्थिता
न्यस्योच्चैर्दिपतो मुमोच न महाघोरः प्रतापज्वरः ॥ ५ ॥
यस्यातिमानुषं कर्षं दृश्यते विस्मयाज्जनौघेन ।

* Alluding to the Paurānic legend of the earth resting on the head of a thousand-headed snake.

† Or beautiful, विकीट.

‡ वैरि recte.

अथापि कोशवर्द्धनतटात् झुतं पवनजस्येव ॥ ६ ॥
 प्रख्यातशक्तिमाजिपु पुरःसरं श्रीकुमारगुप्तमिति ।
 अजनयदेकं स नृपो हर इव शिखिवाहुनं तनयम् ॥ ७ ॥
 उत्सर्पद्वातहेलाचलितकदलिकावीचिमालावितानः
 प्रोयद्दूलीजलौघभ्रमितगुरुमहामत्तमातङ्गशैलः ।
 भीमः श्रीशान्तवर्माक्षितिपतिशशिनः सैन्यदुग्धोदसिन्धुः
 लक्ष्मीसम्प्राप्तिहेतुः सपदि विमथितो मन्दरीभूय येन ॥ ८ ॥
 शौर्यसत्यव्रतधरो यः प्रयागगतोऽधने ।
 अम्भसौव करीपाग्नौ मग्नः सन्पुष्पपूजितः ॥ ९ ॥
 श्रीदामोदरगुप्तोऽभून्नयस्तस्य भूपतेः ।
 येन दामोदरेणैव दैत्या इव हता द्विषः ॥ १० ॥
 यो मौपरेः समितिपूद्गतहृणसैन्यं
 वल्गुहृटां बिषटयन्नरवारणानाम् ।
 सम्पूर्णितः सुरवधूर्वरयन्ममेति
 तत्पाणिपङ्कजमुखस्पर्शविबुद्धः* ॥ ११ ॥
 गुणवद्द्विजकन्यानां नानालङ्कारयौवनवतीनाम् ।
 परिणयितवान् स भूपः शतं निखटायहारणाम् ॥ १२ ॥
 श्रीमहासेनगुप्तोऽभूत्स्माद्वीराग्रणीः सुतः ।
 सर्ववीरसमाजेषु लेभे यो धुरिवीरताम् ॥ १३ ॥
 श्रीमत्सुस्थितवर्मायुद्धविजयस्त्राघापदाङ्कं मुञ्च-
 र्यस्याद्यापि विबुद्धकुन्दकुमुदाचिप्रेन्दुदामायितम् ।
 लौहित्यस्य तटेषु शीतलतलेष्वृक्षफलेष्वेव
 यथासुप्तविबुद्धसिद्धमिशुनैः स्फूर्तं यशो गीयते ॥ १४ ॥
 वसुदेवादिव तस्माच्चूरैस्सर्व्वत उच्चैर्दत्तचरणयुगः ।
 श्रीमाधवगुप्तोऽभून्माधव इव विक्रमैकरसः ॥ १५ ॥
 धत्ते सद्भिरनुसृतां धुरि रणे स्त्राघावतामग्रणीः
 सौजन्यस्य निधानसर्व्वनिचयत्यागे धुराणां धुरम् ।
 लक्ष्मीसत्त्वसरस्वतीं कुलगृहं धर्मस्य सेतुर्हृदः
 पुण्यो नास्ति स भूतले गुणगणैरप्येसरः सद्गुणः ॥ १६ ॥
 वज्रः पाणितलेन सोऽप्युदवहत्तस्यापि शार्ङ्गं धनु-
 र्नाशायामुद्धदां सुखाय मुद्धदां तस्याप्यसिर्नन्दकः ।

प्राप्ते विद्विषतां

* * * * हरिमंसा धन्याः प्रणेमुर्जनाः ॥ अनैम * * * या विनिहता बलिना-
 द्विपन्तः । हत्वा नमस्त्यपुरभिद्य वधाय वीरः । श्रीहृष्कदेव निजसात्तमसा प्रमादे
 श्रीमान् वरेन्द्रदलिनारिकरीन्द्रकुम्भमुक्तारजः ।
 पटलपांशुलमण्डलायः । आदित्यसेन इति तत्तनयः त्रितीशचूडामणिर्यउदयादि
 * * * मागतमरिध्वंसेत्यमाप्तं यशः ॥ स्त्रायं सर्वधनुष्मतां पुर इति स्त्राघां परां
 विधत्ते । आशीर्वादपरं पराचिसं

दमाया समः ॥ आदौ स्वेदच्छलेन ध्वजपटशिखाया मार्जतोदानपङ्क खड्गं चुणेन-
सुक्तशकलसि कलितं न्यस्य Here several lines missing.

मत्तमातङ्गघातं तद्गन्धाद्यसर्पुद्वलपरिमलधान्तमत्तालिजालम् । आवद्धभीम-
विकटधुकुटीकटोमिं

* * वक्तव्यवर्गगोष्ठौ पेशलतया परिहासशीलः । सत्यमर्दव्रता यस्य मुखोप-
वनतोपमा ॥ परिहासाय प * * * भिज्जः सकलरिपुबलध्वंसहेतुर्गरीयात्रिभि-
शेत्खातघातत्रमजनितजतोप्यूर्जितस्वप्रतापः । युद्धे मत्तेभकुम्भस्थल

* * * पुत्रसुखामितवसुमतीमण्डलो लोकपालः ॥ आजौ मत्तगजेन्द्रकुम्भदलन-
स्फीतस्फुरद्दीर्घगो ध्वलानेकरिपुप्रभावविलसत्पुत्रातां यशोमण्डलम् । न्यस्ताशेष-
नरेन्द्रमौलिचरणस्कारप्रतापानलो लक्ष्मीवान् समराभिमानविमलप्रख्यातकीर्ति-
र्दपः ॥ येनेदं शरदिन्दुविम्बधवला प्रख्यातभूमण्डली लक्ष्मीसद्रमकञ्चिद्या
सुमहती कीर्तिचिरं कोपिता । याता सागरपारमद्भुततमा सापत्यवैरादहो
तेनेदं भवनेत्तमं चितिभुजा विष्णोः कृते कारितम् ॥ तज्जनन्या महादेव्या श्री-
मत्याकारितो मठः । धार्मिकेभ्यः स्वयं दत्तः सुरलोकगृहोपमः ॥ शङ्खेन्द्रप्रतिम-
प्रभाप्रतिसमस्फारस्फुरच्छौकरं । नक्रकान्तिचलत्तरङ्गविलसत्प्रचिप्रव्यतिमि । रा-
ज्याखानितमद्भुतं सुतपसा पेपीयमानं जनैस्तस्यैव प्रियभार्यया नरपतेः श्रीकोणदेव्या
सरः ॥ यावच्चन्द्रकला हरस्य शिरसि श्रीशार्ङ्गिणोवचसि । ब्रह्मास्ये च सरस्वती कृत
दत्तभूर्भुजगाधिपस्य च तडित्यावहृन्स्योदरे तावत्कीर्तिमिहा-
तनेति धवलामादित्यसेनो नृपः ॥ सुच्छशिवेन गौरेन* प्रशस्तिर्विकटाचरा ।
न्यस्ता गुणमिता सम्यग्धार्मिकेण सुधीमता ॥

Tentative Reading of the Behar Inscription, No. 1.

- (१) इति चन्द्र + न्द्रानुजत + धन्यो(?) गुणरनदः
- (२) यपिशुनभुविखांसेन यः ख्यातः स्वर्किकु
- (३) सवयस्यो गूढविक्रमेण कुमरगुप्ते
- (४) एतस्य देवस्य हि ह्यकथ्यैः सदादगेभ्यो सि
- (५) चीकरद्देवनिकेतन सदंशे त्रिवंशोपम्यः
- (६) —हं सोढस्तम्भवरोच्चेयुप्रभासे त्रिमण्ड
- (७) वृक्षाणां कुसुमभरानतायसुभयकदम्बस्तवक
- (८) भट्टार्यायाभातिगृहं नवाभनिर्माकनिर्मल
- (९) अनुप्रधानैर्भुविमन्त्रिभिश्च दाकात्मसु +
- (१०) भुजोच्छायमेव चक्रे भट्टार्यादिः
- (११) गुप्तवटे करम्भनिपतिताम्बकटकः कटः
- (१२) सेतुः स्वकर्तुर्यज्ञस्तद्विदं सुकुतं भजतु तत्रै
- (१३) कायहारे सन्धाने ३ सकनुनेभिर्नोप

- (१) + एधिव्यामप्रतिरथस्य
- (२) + नकसयस्य कृतान्तः
- (३) भट्टनश्वमेधा हर्तुः
- (४) केचपौत्रस्य महाराजा
- (५) + देव्यां कुमारदेव्यमुत्पन्नस्य
- (६) + तत्परिगृहीतो महादेव्यां
- (७) मभागवतो महाराजा
- (८) + महादेव्या प्रः भवदेव्या
- (९) + पुत्रः तत्पादानुद्धातः
- (१०) — — स रु गुप्तः
- (११) + + : परमभागवतो
- (१२) + + + भागृहे काजपरकुशले
- (१३) + + य निर्विश्रामक्षेत्र
- (१४) क + + + उपरिककुमारामात्य
- (१५) द्विकुलवणिकपारिभारिक
- (१६) ग्रहारिकशैलिकगौलिकसन्धेस्य
- (१७) वासकादीनन्दादिदप्रासादोपजीविनः
- (१८) तस्मात् विज्ञापितोस्मि मम पितामहेन
- (१९) — भट्ट गुहिलस्वामिना भट्टार्थिका
- (२०) पते बान्धवो कोपतौ मोकाय

LITERARY INTELLIGENCE.

The first edition of the Institutes of Manu, with the Comment of Kullúka, was brought out by the Serampore Missionaries nearly forty years ago. But as it was printed in the Nágari characters, the natives of Bengal could make no use of it, and a Bengali edition was brought out, in the *puthí* form, by Bábu Bhabání-charapa Bandya, in the year 1832, A. D. Both these have been out of print for some time, and Professor Bharatachandra Çiromapi has done a service to the public

by publishing a new edition of the work, together with a Bengali translation. It will be welcome to a large class of readers. It has been very carefully printed, but, as usual with native publications, it has not been edited.

Pandita Lálamohana Bhattácharjya has published a new edition of the Dhátupátha or collection of Sanskrit Roots by Vopadeva, together with a commentary. The work is of use as a guide to persons engaged in the study of the Sanskrit Grammar called the *Mugdhabodha*, and will, we believe, be used as a class-book in the Sanskrit College of Calcutta.

Bábu Prasanna Kumár Tagore, C. S. I., has of late published several Sanskrit works for gratuitous distribution. The last is a treatise, by a Pandita of Nuddea, on Civil Procedure according to Hindu law. It is entitled *Vádiviváda-Bhanjana*, and contains a number of extracts from the old Smritis on the course which a case should follow, from its institution to the final decree, in the court of a Hindu Rájá. The chapter on the law of evidence is particularly interesting. The work is printed in the Bengali character, and has a Bengali translation attached to it.



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EDITED BY

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"It will flourish, if naturalists, chemists, antiquaries, philologists, and men of science in different parts of *Asia*, will commit their observations to writing, and send them to the Asiatic Society at Calcutta. It will languish, if such communications shall be long intermitted: and it will die away, if they shall entirely cease."

SIR WM. JONES.

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PART II.—PHYSICAL SCIENCE.

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Physical Character of the Karens.—By the Rev. F. MASON, D. D.

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KARENS.*

The name Karen has been adopted from the Burmans, who apply it to various uncultivated tribes, that inhabit Burmah and Pegu; but it is used, in these notices, as designating a people that speak a language of common origin, which is conveniently called Karen; embracing many dialects, and numerous tribes. These tribes, though speaking a common language, have no common name with which to distinguish themselves; but in this respect, they do not differ from our own ancestors. Cæsar found some twenty or thirty different tribes in Britain, but it does not appear that they had any common name by which they designated themselves.

* The following pages are offered as answers to "Queries respecting the human race addressed to travellers, by a Committee of the British Association for the Advancement of Science," at the request of Col. Phayre; and embrace all the writer has to say on the general division of the Queries, entitled "Physical Characteristics;" from Query 1 to Query 49.

No answers are given to Queries 5, 6, 7, 8, 9, 10, and 30, relating mainly to anatomy, because satisfactory ones have not been obtained. Nor are answers given to Queries 13, 14, 15, 16, because the writer has already published on the subject of Language in the Journal of the Asiatic Society of Bengal, and in his work on "Burmah." To write again on the subject, would necessarily compel him to repeat considerable of what is already in print, which seemed undesirable.

The word Karen has been supposed to signify *aboriginal*, from *yen** "first," and *ka†* a formative particle; but the derivation is European, not Burmese. The Burmans have never been so recondite in naming wild tribes. When the Buddhist missionaries landed at Martaban, they denominated the aboriginal inhabitants *Beloos*, or "Monsters," and the Burmese still retain the name for a tribe of Karens on the borders of Karenee. The subdued Bghais they dispose of as *Loo-Yaing,‡* "wild men;" while the more civilized Mopghas that bring honey and bees' wax for sale, they call *Taubya,§* "wild bees;" and they find in the dress of another a distinctive name, and call them "Red Karens."

The word *Karen* is probably a Karen word. One of the northern Karen tribes, with which the Burmans must have held most intercourse before they conquered Pegu, call themselves *Ka-yong*, which is sufficiently near the Burmese to be the same word. Then we have a precisely parallel case in the name they give this tribe, which is *Gai-kho,||* a Karen word that is manifestly identical with *Kai-khen*, the name the other Karen tribes give them.

Eight distinct Karen tribes are known, who speak dialects so diverse, that they cannot understand each other; and yet, on examination, the larger proportion of the roots of each dialect are of common origin.

These tribes have often several names, and not only are travellers misled by them; but residents often take up wrong impressions and give, for distinct nations, names that refer to the same tribe.

A few of the tribes only have distinctive names for themselves, and all, when speaking to each other, use the word for man to designate themselves; precisely as the Hebrews use the word for man as the proper name of the first man, Adam. Were these terms for man adopted in English, the tribes would be much more accurately distinguished than they are at present. Thus we should have

Pgha-knyan	for	Sgau.
Pie-yà	"	Bghai.
Prà-kā-yà, or Kā yà	"	Red Karen.
Heu-phlong	"	Pwo.
Peu	"	Taru.
Plau	"	Mopgha.

* ရင် † က ‡ လူရိုင်း § တော ဗျား || ဂို

Pray-kă-yong	for	Kay or Gaikho.
Lau	„	Toungthu.

Sgau, or Pgħa-knyan.

This tribe is known by a diversity of names.

Sgau, the name the tribe give themselves.

Burmese Karens, thus designated by some English writers.

White Karens, the name given them by English travellers to distinguish them from the Red Karens.

Myeet-tho, so designated by the Burmese.

Shan, the name the Pwas give them.

Pa-ku, the name by which they are known in Toungoo, and to the Red Karens; but it more properly denotes a sub-tribe of Sgaus.

Shan-ne-pgħa, a name given to another sub-tribe of Sgaus.

We-wa, a small sub-tribe of doubtful origin, but probably originally Sgaus.

Bghai, or Pie-ya.

The Bghais have no distinctive name for themselves, besides Pie-ya.

Bghai is the name the Sgaus give them, and they recognise the name so far as to apply it with an adjective to sub-tribes among themselves.

Bghai-kă-teu, "Bghais at the end," is the name of the Tunic Bghais, as used by the Pant Bghais; because they live at the extremity of the tribe nearest Toungoo.

Tunic Bghai is the name given to the above sub-tribe, by English writers, because they wear tunics or frocks.

Bghai-kă-hta, "Upper-Bghai." The Pant Bghais are thus denominated by the Tunic Bghais, because they live on the streams above them.

Pant Bghai is the denomination by which all the Bghais that wear pants are known to English writers.

A-yaing, or Ka-yen Ayaing, "Wild Karens," is the name the Burmese give to nearly all the Pant Bghai.

Leik-bya-gyie, "Great Butterflies" is the Burmese name of a portion of the Tunic-Bghai.

Leik-bya-guay, "Little Butterflies" are other villages of Pant Bghai.

Pra-pa-ku, is the name given by the Red Karens to the Bghais that live near the Pa-kus.

Manu-manau is a Burmese name given to a mixed sub-tribe of Bghais.

Pray is the Red Karen name applied to the Manu-manau and to some other clans related to the Bghais.

Lay-may is Burman for a sub-tribe of Bghais, called Pray by the Red Karens.

Shan-kho is a name given to a Bghai clan in the north-eastern part of Toungoo.

RED KAREN, or KA-YA.

The Red Karens have no name for themselves, except Ka-ya, or Prà-kā-ya.

Ka-yeu-nie, "Red Karen" is the name given them by the Burmese, on account of the red-striped pants they wear.

Bghai-mu-hta, Bghai-mu-htay, names given them by the Bghais, signifying "Eastern Bghai."

Yang-laing, "Red Karens" is their name among the Shan tribes.

The-pya the name by which the Kay people designate them.

Ta-lya a small sub-tribe of Red Karens, are thus denominated by the Red Karens themselves.

Yen-ka-la, the Burmese name of the above clan.

Tha-vie, or Tha-vie-la-kha is a Red Karen name for a people of their own tribe living ten days' journey above them, on the Salween, and who were separated from them when driven from Ava, sixteen generations ago.

In 1861, our Assistant in Karenee reported a singular letter that was sent by them to Karenee; the object of which was not stated distinctly, but it was understood as a challenge to fight. The following is a translation:—

"Now, the words of God and his commands have come to us. Let all men give up the customs of their ancestors, and offerings to spirits, and live in peace. As for us in the land of Tha-vie, we will dwell in peace and obey the commands.

"Nevertheless, at the proper time we will make a feast; and this feast is not a woman's feast, but a man's feast; and when the time arrives to dance, we will dance. And the shades of the dead, and the



spirits will look on. We say to you, if you wish to look on, come and look, and bring sword and spear. We have appointed the month of March for the time of holding the feast."

PWO, or HEU-PHLONG.

The Pwos call themselves Sho.

Pwo is the name given them by the Sgau.

Meet-khyen is a name given them by the Burmese, signifying "River-khyens."

Talaing-Karens is a designation they have in some published papers, and they are sometimes thus designated by the Burmese, because they are principally found among the Talaings.

Shoung is a name given to a small sub-tribe of Pwos in the north of Toungoo.

TARU, or PLU.

Taru is the name given to a tribe nearly related to the Pwos by the Red Karens.

Khu-hta is the name they give themselves.

Be-lu or monsters is the name by which they are characterized by the Burmese. A part of the tribe shave the whole head excepting two tufts of hair, one on each temple, which gives them a sufficiently frightful appearance to account for the name the Burmese have given them.

Be-lu-ba-doung is the name given them by the Kay tribes.

MO-PGHA, or PLAU.

Mo-pgha is the name of one of the villages, from which the missionaries have named the whole tribe; but it is a name they do not recognise themselves. Neither do all call man Plau. Small as is the tribe, there are two or three different dialects among the people, and we have Pie-zau, and Pie-do for man, as well as Plau.

Tau-bya, "Wild Bees" is a name the Burmese give them in some settlements.

Bgha-Pwo is a designation sometimes given them.

KAI, GAIKHO, or PRAI-KA-YOUNG.

The Kai, or Kay, or Gaikho have no distinctive name for themselves, beyond Prà-kā-young, or Kā-young, their word for man.

Kā appears occasionally as designating the people, but it signifies land in their dialect, and properly denotes the country.



Kai, or Kay is the name given them by the Bghais, but they never use it alone. They make three divisions of the tribe.

Kai-kheu "Upper-Kai," often applied to the whole tribe.

Kai-la "Lower-Kai."

Kai-pie-ya "Kai's people."

Gai-kho is the name which the Burmese give them in imitation of the Bghai Kai-kho.

Pa-htoung is the name the Red Karens give them.

Hashwie is a small tribe related to the Kay, and thus denominated by the Bghais.

Hasñu is the name they give themselves.

TOUNGTHU, OR LAU.

The Toungthus are related to the Pwos by their language.

Toung-thu is the name given them by the Burmese.

Pa-au is the name by which they designate themselves.

There is nothing to associate this tribe with the Karens but their language, excepting that the people have the appearance of being a Shan tribe.

SHAN KARENS.

The generic name that the Shans give the Karens in their own country is Yang, which is softened in Burmese into Yen, or Yein. Hence we have of the following Karen tribes is the Shan country of which we know little more than the names.

Yang-lang, "Black Karens."

Ying-ban.

Yen-seik.

Yein.

Sok, or Tsok is the name the Shans give all the Karens that reside in the Burmese territories, without distinction of tribe.

PHYSICAL CHARACTERISTICS.

Though the preceding tribes are one in language, they are scarcely one in anything else. They differ materially in their physical characteristics.

The Pwos and Toungthus, that usually inhabit the lowlands, resemble the Burmese, who inhabit similar localities; in their physical traits more than they resemble the Karens that dwell on the mountains. They are a short muscular people with large limbs, larger than

the Burmese ; while the mountaineers are usually of little muscle and small limbs. It is a popular idea that mountaineers are stronger, and hardier than lowlanders, but, however, it may be in other lands, it is certain that in Burmah the mountain tribes are weaker people than those who live on the plains. The cause, however, may possibly be other than the locality.

In stature, all the Karens, excepting perhaps the northern tribes, are shorter on an average than Europeans. In a promiscuous assembly of one hundred men, embracing several tribes, two were *five feet seven inches* high, eight were *five feet six and a half inches*, and all the rest were shorter. An intelligent man that measured *five feet five inches and a half*, was confident that he was taller than the average of Karens. I should fix the average at from *five feet four and a half to five feet five*. The shortest man I have measured, is a Bghai chief, who was only *four feet eight inches* high ; and the tallest Karen I have seen, was not quite six feet.

A company of one hundred Karen women had only two that were *five feet one inch* high, eight were about *four feet ten* ; and the rest shorter. The average cannot be more than *four feet nine*. The shortest woman I have noted, was *four feet five*.

In different villages, the average would vary considerably from the above. A village of Mopghas, on the hills, that can be seen with a glass from the city of Toungoo, is remarkable for its short men, especially the younger ones. I doubt there being one over five feet high. On the contrary, the northern Bghais and Gaikhos are comparatively tall, perhaps as tall, usually, as Europeans ; but they are a small minority ; and I attribute their superiority, in part, to the higher and cooler region that they inhabit.

Though small in stature, the Karens appear to be tolerably well proportioned. No prevailing disproportion between different parts of the body has been noted.

In those parts of the body which are not exposed, the northern Karens, at least, are as fair as the Chinese. The young people, both male and female, among the Gai-khos and northern Bghais, often show red and white in strong contrast on their countenances ; altogether unlike the uniform clay colour of their more southern relatives. I have met with individuals, who, if seen alone, would be pronounced

part European. Indeed, if not exposed to the sun, some of them would be as fair, I think, as many of the inhabitants of Northern Europe.

The yellow tinge of the Chinese is very distinctly seen on many of the Karens, particularly the females; and yellow, as well as white, is considered handsome, by Karen connoisseurs of beauty.

The hair is straight and coarse, usually jet black; but a few have brownish hair.

The eyes are commonly black, but as we proceed north, many hazel eyes are met.

The head is pyramidal, the breadth of the face across the cheek bones wider than across the temples, and the bridge of the nose rises only slightly above the face. Occasionally a decided Roman nose is seen, but there is still a depression between the eyes not possessed by the Romans. The face is lozenge-shaped, and the whole countenance, in typical specimens, is Mongolian. There is a great diversity in individuals, and these traits are less developed in the more civilized Sgaus and Pwos than in the wilder Pakus and Bghais.

It is not easy to describe the characteristic countenances of the different tribes, yet there are characteristic differences, which the experienced eye detects. There is considerable too in locality, which affects the countenance, apart from the difference of race. Thus the Sgaus of Tavoy and Mergui can usually be distinguished from the Sgaus or Pakus of Toungoo. Education also affects the countenance. The Karens that have been educated in our Mission schools look like quite a different tribe from their wild countrymen on the hills.

The Karens rarely marry with other races; but among those who are settled near the Burmese, a Burman is sometimes found with a Karen wife, and in every instance that has come under my personal observation, the children have had a strong Burmese cast of countenance. There in a village near Toungoo where there are several of these mixed families; Europeans do not distinguish them from Burmans. Still, persons acquainted with the Karens, readily recognise them as a mixed race. There is a village, however, on the mountains called "Village of Talaingings," that tradition says was settled by a company of Talaing men who fled into the jungles during some of the wars in Pegu two or three centuries ago; but there is very little in the coun-

tenances of their descendants to distinguish them from other Karens. Their faces are a little longer, their cheek bones not quite so widely expanded, and their faces have a little less of the lozenge shape.

BIRTHS.

When a child is born, in some clans the mother, in others the midwife, cuts the umbilical cord, and puts the placenta into a joint of a large bamboo, and wraps it in a rag. The father then takes it and hangs it up on a tree. An abortion is treated in a like manner, but the tree selected is a species of *Ficus*, and the abortion is supposed to become one of the *Cicadæ* that are so often heard singing at evening.

On returning to the house, if the child be a girl, the father goes through the pantomime of performing a woman's labours, beating paddy in a mortar, and the like. If a boy, he spears a hog, and, seizing the first man he meets, wrestles with him, to indicate what his son will do when he comes to manhood.

The knife with which the navel string is cut, is carefully preserved for the child. The life of the child is supposed to be in some way connected with it, for, if lost or destroyed, it is said the child will not be long lived.

About the third day, when the navel string sloughs and comes away, the father takes his net, and, with a few friends, goes out fishing and hunting. The success of the party is deemed prophetic of the character of the child. If much fish or game is obtained, he will be prosperous; if little, he will be unfortunate.

On the return of the party, a feast is made, the friends are invited, and the child is purified and named. Children are supposed to come into the world defiled, and unless that defilement is removed, they will be unfortunate, and unsuccessful in their undertakings.

An Elder takes a thin splint of bamboo, and, tying a noose at one end, he fans it down the child's arm; saying:

"Fan away ill luck, fan away ill success;
Fan away inability, fan away unskilfulness:
Fan away slow growth, fan away difficulty of growth:
Fan away stuntedness, fan away puniness:
Fan away drowsiness, fan away stupidity:
Fan away debasedness, fan away wretchedness:
Fan away the whole completely."

The Elder now changes his motion and fans up the child's arm ; saying :

“ Fan on power, fan on influence :

Fan on the paddy bin, fan on the paddy barn :

Fan on followers, fan on dependants :

• Fan on good things, fan on appropriate things.”

He next takes a bit of thread that has been prepared for the purpose, and tying it round the child's wrist, says : “ I name thee A. B. ;” using the name that the parents had previously determined upon.

Sometimes a name is selected from among their ancestors, or other relatives ; but in such cases they are always careful to select one whose bearer was rich, or valiant, and prosperous ; ever avoiding the poor and unfortunate, as they suppose the name influences the character of the man.

Often a name is selected indicative of the state of the parent's mind at the time the child is born. A man rejoices at the birth of a son, and he names it “ Joy.” A mother is suffering, and she calls her daughter, “ grief.” Another has a son born when he is hoping for deliverance from Burmese oppression, and the advent of White Foreigners, so he names him “ Hope.”

Frequently a child is named from some circumstance connected with its birth. One is called : “ Father-returned,” because the father returned from a journey just as the child was born ; and another is named “ Harvest,” because born at harvest time. For like reasons we have, “ New-house,” “ Sun-rise,” “ Evening,” “ Moon-rising,” “ Full-moon,” and “ February.”

Sometimes the child is named from its appearance, and hence we meet with the names “ White,” “ Black,” and “ Yellow.” “ White” is about as common a name in Karen, as Smith or Jones in English.

The animal, vegetable and mineral kingdoms all occasionally furnish names. There are “ Tiger,” “ Yellow-tiger,” “ Fierce-tiger,” “ Gaur,” and “ Goat-antelope ;” “ Hornbill,” “ Heron,” “ Prince-bird,” and “ Mango-fish ;” “ Eugenia,” “ Job's-tears,” “ Cotton,” “ Gold,” “ Silver,” and “ Tin ;” with many others of a like character.

When the child grows up, and develops any particular trait of character, the friends give it another name, with “ father” or “ mother” attached to it. Thus, a boy is very quick to work, and he is named

"Father of swiftmess." "If he is a good shot with a bow and arrow, he is called "Father of shooting." When a girl is clever to contrive, she is named "Mother of contrivance." If she be ready to talk, she becomes "Mother of talk."

Sometimes the name is given from the personal appearance. Thus, a very white girl is called "Mother of white cotton;" and another, of an elegant form, is named "Mother of the pheasant."

Occasionally, the name refers to locality. Thus, one living near the Sitang, is "Father of the Sitang;" and another, on the borders of the Thoukyekhat, is "Father of the Thoukyekhat."

Frequently a second name is given without "father" or "mother" being attached to it. Thus, a handsome young person is denominated "Yellow-rising sun;" and one with remarkably long hair, "Horse-tail."

When a man is married, and has a child born to him, his name is changed again to the father of that child. The mother's name is changed in like manner. Thus, I have a Bghai writer called Shie-mo, and his father is known as the "Father of Shie-mo; and his mother, as the "Mother of Shie-mo."

Where there are two persons of the same name, they are distinguished by appending to their names the names of the villages where they reside; analagous to the Norman *de* followed by the name of a place.

The Red Karen ceremonies, at the birth of a child, differ considerably from those noted above. With them, after the child is three days old, the time at which the mother is deemed convalescent and able to walk out, a feast is made by the parents, and the house is open for all to come and eat and drink who choose. All who come are treated as brethren. After the feast, the mother takes the child in a wrapper, on her back, and goes down out of the house. She is then supposed, by a legal figment, to proceed to the paddy field, but in fact she goes out a few yards, digs the ground a little with a hoe, or spade, pulls up a few weeds, and returns to the house. These are symbolical acts, by which the mother pledges herself to labour for the support of the child. The mother next carries her babe to the houses of her near relatives, where the people visited present the child, if a boy, with silver or iron; if a girl, with beads, or a chicken, or a pig.

After these preliminaries, the child is named; often after some person that has been visited who made handsome presents; and always

after some relative, that the memory of their ancestors may be preserved.

Infanticide is rare. Occasionally, when the mother dies, the infant child is killed and buried with her; and I have known a woman confess that she killed her little sister, soon after her birth, because it was ugly; but such things are not common. Children are not exposed.

No measures are taken to alter or modify the form of a child, or any of its limbs. It is carried about in a wrapper, naked, till it can walk, when it is sometimes clothed in a loose tunic; but more often, it is allowed to run about naked. No modification of the limbs is practised.

Among no people are children taught so little as among the Karens; and nothing is taught them to modify the character. They grow up like weeds, and are remarkable for nothing so much as for their wilfulness and disobedience. Yet the Sgaus have a very stringent injunction to obedience to parents. The Elders say:

"O children and grandchildren! respect and reverence your mother and father; for, when you were little, they did not suffer so much as a musquito to bite you. To sin against your parents, is a heinous crime.

"If your father or mother instruct or beat you, fear. If you do not fear, the tigers will not fear you."

They are also taught to obey kings; another of the commands of the Elders being: "O children and grandchildren! obey the orders of kings, for kings in former times obeyed the commands of God. If we do not obey them, they will kill us."

There is nothing remarkable in the sports of the child.

The age of puberty may be set down at from twelve to fifteen years. The people not having had the means of keeping their ages, nothing precise can be affirmed that depends on a knowledge of the age. The Karens consider fifteen as the marriagable age.

While writing, six Karens came in, and on inquiry, one says his mother had five children, two say their mothers had eight, two belonged to families of twelve children, and one man of about fifty years of age is the last surviving child of thirteen by one mother. Women that live to forty-five years of age probably bear on an average from nine to ten children. The Karens consider ten as the proper complement.

A verse from an old song intended to teach the duty of children taking due care of their aged mothers, says :

“ A mother can bear ten children,
A child cannot bear ten mothers :
A mother bears ten children
And her strength is exhausted.”

Twins are very uncommon ; much more so than among European nations ; and I never heard of more than two at a birth.

A large family is deemed a great blessing. When seated around the fire at night, they sometimes sing :

“ People’s Kyee-zees many, I covet not,
People’s money much, I covet not,
I covet young paddy ten cubits high,
Good children and good grandchildren.”

The proportion of sexes among adults is remarkably equal, for it is very rare to find either man or woman over twenty-five years of age that is not married or has been married. The proportion in infancy cannot be very diverse.

Children are reared with difficulty. Large numbers die in infancy from want of care, and from ignorance of the proper way to manage the diseases of children.

Nothing remarkable in their senses has been observed, excepting that their eyes are uncommonly good in seeing objects at a distance ; but which may be the result of habit. When I have shown them the villages on the distant hills through my glass, and asked if they did not see them plainly ; the reply has often been : “ Yes, but I can see them about as well without the glass.”

The women bear children to quite as late an age as Europeans. Women, that I should judge to be between forty and forty-five, may be often seen with children at the breast.

Three years is the period for which a child is deemed entitled to his mother’s milk ; but they are oftener suckled longer. It is not uncommon to see a woman suckling her babe at one breast, and its elder brother or sister at the other.

BETROTHAL.

The Karens go on the principle that marriages are made in heaven. They believe that parties who marry do so in accordance with an engagement into which their sentient spirits entered in the presence of God, before they were born.

It is a very common practice among all the tribes, except the Red Karens, for parents to betroth their children while young, if not in infancy. They have an idea that children are benefitted by it. If a child is sickly, the parents say, "We had better seek a wife for this boy. A wife may invigorate him and make him stronger."

Some one then who has a daughter is selected, and if the parents are agreed, and the fowl bones give a favorable response, a feast is made, and the children are betrothed. The feast is provided by the parents of the boy, and one of the Elders offers the prayer of betrothal, saying: "Lord of the land and water, Mokhie of the land and water; these two are engaged to be united in marriage. May they have long life, may they produce seed, may their shoots sprout forth, may they grow old together!"

After a boy and girl have been betrothed, should they, on coming to marriageable age, be unconquerably averse to the union, the parents say: "Ah! their spirits did not consent, their guardian angels did not make the agreement."

The young people sing:

"God and the spirit;
Without their consent,
No marriage is made.
God and the spirit,
And with their consent
No marriage is staid."

Should there be a mutual desire to sever the engagement, the parents of the youth go to the friends of the girl; and after the introductory remark that the union does not appear to have been agreed to in heaven, they say: "They were not planted together, they were not sown together, and they do not love each other. Water spilt, leaves the vessel empty; flour thrown out, leaves the basket empty. There must be the loss of half, and the paying of half." Then the parents of the girl pay half the expenses of the feast at the betrothal.

ENGAGEMENT.

When a young man wishes to take a girl for a wife, the first persons to be consulted are her parents. If they make no objections, he employs a go-between to transact the business for him.

The go-between takes a fowl and gives it to an Elder who consults its bones, and if the response is unfavorable, the match is broken off and no further proceedings taken.

When the fowl's bones are read as approving the marriage, the go-between goes to the parents of the girl, when, in some sections, the following form of dialogue takes place :

Go-between.—"Now I will creep up thy stairs, I will tread on the steps of thy ladder. Thou plantest up large house posts, thou flattenest out wide bamboo planks. Thou callest thyself the master of the house, a good man. When the sun rises, it shines upon thee ; when the moon rises, it shines upon thee. Thy head is as large as a still pot, thy tongue as long as the gigantic bean pod. How wilt thou reply ? The children lift their eyes on each other. They lift their hearts on each other's heart. Wilt thou approve ? "

Girl's Guardian.—"Man is the horse's tooth ; the elephant's tusk. Woman is a tree, a bamboo. We are the woman, the female. We cannot reach distant waters, nor arrive at far off lands. We dare not seize those who seize us, we dare not strike back again. The man can reach waters, and arrive at distant lands. Can he take upon himself the charge of a house and a field ? "

Go-between.—"Fear not, be not anxious, for the house and the field. Mother dying, occupy mother's chamber ; father dying, occupy father's hall. By day, there is one sun ; by night, there is one torch. Fear not, be anxious for nothing."

Girl's Guardian.—"If thy word is true to thyself ; if thy language is faithful to thyself ; if thy word is one, thy foot-print one—Let not the tree depart from its shadow, let not man leave his place—very good. Thou art a hunting dog, thou scentest the covert ; thou trackest the game. Art thou satisfied ? "

Go-between.—"I am a hunting dog, and in scenting the hiding place, and tracking the game, I have got to thee."

Girl's Guardian.—"Thou art a hunting dog. What ornaments hast thou brought ? Let me take a look at them."

When the work of the go-between is done, the friends of the young man take a hog, an ox, or a buffalo, according to their circumstances, and, leading it to the dwelling of the parents of the girl, they kill it and examine its gall bladder. If the bladder is full, they say the omen is favourable to the union; but if flaccid, containing little liquid, it is deemed unfavourable. Still, a feast is made, but it is eaten in sadness, and the people murmur, "If they are married, they will have no children; they will be unsuccessful in their undertakings, and they will die young." Sometimes the marriage is broken off, and sometimes it proceeds.

If the gall bladder be plump, there is great rejoicing, and all say, the couple will live to old age, and have a numerous posterity. Before partaking of the feast, an Elder takes a bit of the liver and viscera of the animal together with boiled rice on a plate, and, pouring them out on to the earth, prays; "Lord of the heavens and earth, Lord of the lofty mountains and high hills, we give thee food and drink. May these two persons prosper and be successful, may they have a posterity, may they live to old age, that they may bring up sons and daughters." After the prayer, the elders eat, and then all the people eat after them. After eating, they drink spirits, beat kyee-zees, dance, and sing songs.

After this engagement feast, sometimes the marriage takes place in a few days, but frequently, for various reasons, it is delayed for a considerable period, sometimes for years; and when the delay is protracted, it is not uncommon for the engagement to be broken off.

Should the girl refuse to fulfil her contract, she must pay all the expenses of the engagement feast with interest. "If a hog was killed, she must repay a buffalo. If a horse was offered, she must repay an elephant; and there is the shame besides."

These exaggerated demands are never exacted to the letter. In general terms it is said: "If a man breaks his engagement, he loses his outlay; if a girl breaks her engagement, she must pay a fine."

If a young man wishes to break the engagement, he publicly declares that he will sacrifice all the affair has cost him, and ask no return: "Let the fowl be," he says, "as if the hawk had taken it. Let the food I furnished the parents be as if the tiger or leopard had devoured it. Let the presents I made her relatives be as if sunk in



the water, or destroyed by fire." After this public declaration, the girl is considered at liberty to receive proposals from others; which, without it, she is not.

MARRIAGE.

If there are no obstacles to an immediate union, after an interval of two or three days, the relatives of the bride conduct her to the house of the bridegroom's parents, with a procession of her friends blowing trumpets. When the bride ascends the ladder into the house, water is poured on her abundantly from the verandah, till her clothes are wet through. She then eats with the bridegroom's relatives, and, attended by her female friends, she goes into the chamber. The young man's friends make presents to all the party, giving the most valuable to the relatives of the bride.

When the time for the company to separate approaches, two of the Elders take a cup of spirits, which is called "the covenant drink," and one speaks for the bride, and the other for the bridegroom.

One says; "Now the woman is thy wife, thy daughter-in-law, thine own daughter, thy own wife who will live with thee. Should she be drowned, should she die by a fall, should she be bitten by a poisonous snake, we can say nothing. But should she be killed in a foray, should she be carried into captivity, should she be put in bonds, thou must purchase her freedom, or obtain the price of her blood."

The other Elder then says: "What thou sayest is true. She is not the child of another, she is my child, my wife, my daughter-in-law. Should she die by accident, I can do nothing. I will lay her out, put food in her mouth, drink by her side, make a funeral feast, and bury her. But should she be carried into slavery in a foray, I will carry a kyee-zee for her redemption, and thou must demand a fine. I will carry spirits to drink, thou must spread out food to eat. We together will purchase the woman. But if we cannot obtain her if she has been killed or is lost, we will demand her price. If I ask her price in kyee-zees, thou must demand it in slaves. We together will make it a reason for making reprisals; and if I am the father of the foray, thou shalt be the mother of it. If I am the head of the foray, thou shalt call the army; and if I call the army, thou shalt be the head of the



foray ; and we will work together. If I go first, thou shalt come last ; and if I come last, thou shalt go first."

Each one then gives to the other to drink, and each says to the other : " Be faithful to thy covenant."

This is the proper marriage ceremony, and the parties are now married.

Now, the people say, they are man and wife and may live where they choose, with the parents of the man, or with the parents of the woman, or may live independent of both. " They may have food or no food ; clothes or no clothes ; may live in peace, or fight and quarrel. No one will interfere. It is nobody's business but their own. No one has any right to control them." As a matter of fact, however, the young man usually goes to live with the parents of his wife, and remains with them for two or three years.

Marriage ceremonies among the Red Karens differ materially from those described above. They never betroth their children in infancy, but leave the young people to make their own engagements.

When the parties have agreed to marry, the man kills one or two hogs or fowls in his own house, and makes a feast. To this the friends of the bride, male and female, conduct her ; and she eats and drinks, and spends the night in the house with her companions.

In the midst of the feasting, and in the presence of the whole company, the bridegroom offers a cup of spirits to his bride, who drinks it up ; and then he asks her : " Is it agreeable ? " To which she replies : " Very agreeable."

The next day the bride returns home and makes a similar feast, to which the bridegroom and his friends go. It is now her turn to offer the cup to him, and when he replies to her question : " Is it agreeable ? " that it is " very agreeable," the two are regarded as married.

Often, however, the reply is playfully given : " Not agreeable," and then the feasts have to be repeated till the favourable response is obtained.

Marriages, according to the Bghais, ought to be always contracted among relatives. First cousins marry, but that relation is considered undesirably near. Second cousins are deemed most suitable for marriage. Third cousins may marry without impropriety, though that



relation is considered as undesirably remote. Beyond third cousins marriages are prohibited.

CHASTITY.

Among the Red Karens, chastity, both with married and unmarried, is reported as remarkably loose. The commerce of the sexes among young people is defended as nothing wrong, because "it is our custom." The Sau-bwakepho has a regular rule to give six rupees damages in cases of rape; but these are the only cases of *crim. con.* that he entertains in his courts.

Chastity is cultivated, however, by the other Karen tribes; and one means by which it is preserved, is early marriages. The great majority are married soon after the age of puberty. Still, while the young people are as chaste as most people in Christian nations, lapses among the married are not uncommon; but illegitimate children are very rare.

The Sgaus at least are not wanting in good precepts, notwithstanding, for a contrary course. The Elders say:

"O children and grandchildren! do not commit adultery, or fornication, with the child or wife of another; for the Righteous One looks down from above, and these things are exposed to him. Those that do thus, will go to hell.

"If you meet the wife of another, avoid her, and pass on the lower side of the road."

Though the Bghais do not appear to have precisely the same form of command, yet they regard adultery as particularly offensive to God, and as being the cause sometimes of bad crops.

Human nature is the same everywhere, and the betrothal of children in infancy often results in unhappy marriages, and unfaithfulness to the marriage tie.

Sometimes the parties, on becoming of marriageable age, so dislike each other, that they rebel against the authority of the Elders, and form connections for themselves more congenial to their tastes.

POLYGAMY.

Polygamy is neither permitted nor practiced by any of the Karen tribes; but Karens who live in the neighbourhood of the Burmese



sometimes adopt the Burmese custom of taking an additional wife, as they do that of worshipping idols. The Sgau Elders charge their children :

“ O children and grandchildren ! If you have one husband or wife, lust not after another, male or female ; for God at the beginning created only two, one male and one female.”

DIVORCE.

Divorces are not unfrequent, arising often from marriages being made by the parents of the betrothed in infancy, and the children grow up without any love for each other.

If a man leaves his wife, the rule is that the house and all the property belongs to her. He is allowed no claim on his money and valuables that may be in the wife's possessions, after he has left her. Nothing is his but what he takes with him.

If a woman forsakes her husband, it is usual to allow a share of the property, but no more than the husband consents to allow.

WIDOWS.

Widows retain their husbands' fireplace, and endeavour to support themselves. When young they usually marry again ; but if old and unable to support themselves, they look for help to their own relations, and often suffer from neglect. The obligation to treat widows kindly is recognised in theory, but often neglected in practice. The following story from the Bghai gives a too true picture of this matter.

“ Formerly, there was a woman whose husband died, and left her to get a support as best she could. All her children were small. Their father had forsaken them, and the mother took care of them in any corner or interstice she could find.

“ She had no relations of her own in that country. She had none but her husband's relations, and her husband was dead, and his relations would not help her. She could not therefore get curry to eat, and she fed her children on the sheaths of the blossoms of the wild plantain flowers : these she called to the children “ brains,” and they knew not, but that was the proper name.

“ When the neighbours heard the children say they lived on brains, they said : ‘ The woman is a witch ! Morning after morning it is

brains; evening after evening it is brains. It must be she goes and gets human brains to eat. We cannot get so many brains: and they have no father. Where can so many brains come from?

"After awhile they concluded they would kill her for being a witch, and they made known their intentions to an uncle of hers. He said: 'Wait till I can go and see her.' When at leisure, he went to see the family. He killed a deer, took the head to the children, and showed the brains to the children, asking: 'Does your mother feed you with brains like these?' They all replied: 'No, uncle, mother feeds us with brains that are bright red.' There are no fibres in them like these.'

"The uncle then repeated his enquiries successively with the heads of a horse, an elephant, a bear, a goat-antelope, a bison, a barking deer, a porcupine, a bamboo-rat, a squirrel, a tupai, a rat, a bird, a fowl, a snake, a frog, a fish, and every kind of animal known in the country; but the children said to all, 'Uncle, our mother feeds us with no such brains as these.'

"He thought to himself; 'It is not this, and it is not that. Surely the woman is a witch, for there is no other kind of brains it can be, but human brains.' So he concluded it was best to kill her.

"However he went out hunting one day more, and all day he met with nothing; so on his return home he plucked two sheathes of wild plantain blossoms, and bringing them into the house, he laid them down by the wash stand. One of the children saw the bright red sheathes; 'My uncle has brought me some brains, I will eat them all myself, I will not give a taste to any one else.' All the children rejoiced greatly, and said 'These are the brains on which mother fed us.'

"When the uncle knew that his niece was not a witch, he almost fainted at the thought of having so nearly consented to her death."

Food.

A Karen is a most omnivorous animal. Always excepting the feline race, he eats every quadruped from a rat to an elephant; and there is scarcely a reptile unacceptable to his palate, from a sand lizard to a crocodile, and from a toad to a serpent. Flying ants and crawling grubs are in his bill of fare; and there is no bird too tough, no fish

too bony for his table. Dogs are not eaten by the Southern Karens, but they are as great delicacies in the Bghai country as they are in China.

To this great mass of animated nature, the whole vegetable kingdom is made to serve as greens. Nearly every weed is a vegetable, and the young shoots of the largest trees serve as spinage. They are so careless about what they gather for greens, that one of our young teachers poisoned himself, not long ago, by the vegetable curry he made by the way, while travelling.

Besides game, the Karens raise hogs and fowls for home consumption as well as for sale, and on festive occasions, those who are able, purchase and kill a buffalo or ox; so they do not seem to lack for animal food. Still, they may be often seen sitting down to rice and vegetable curry, with perhaps a taste of dried fish, and they certainly do not eat as much animal food as Europeans. They live much like the wild beasts of the forest. When chance, or something very like it, sends them a whole beast, they eat meat to surfeit; and then they live on vegetables and rice, till the wheel of fortune turns round again.

The meat is often cut into small pieces and boiled in curry; but it is also frequently roasted or grilled. Fish is often dried, as is also the flesh of game sometimes; but dried so imperfectly, that it usually has a very bad odour.

The Karens distil from rice or millet a kind of whiskey, of which men, women, and children often drink to intoxication. But, like their meat, this too they have not on hand constantly; and they are sober a great part of the year, because they cannot get anything to drink to be intoxicated.

In the matter of quantity, they take more food at a meal than Europeans; and yet, if labouring hard, require to eat more frequently. I have often walked with them, up hill and down; and though I could walk all day, from sunrise to sunset, after an early breakfast with a couple of crackers, and water from the brook by the way; the Karens were always knocked up by noon; and had to stop and eat a hearty meal, before they were able to proceed. This is true of all the natives in the country; but is not quite understood by some of our medical men. Natives are sometimes taken into the hospitals, and



actually starved to death by not having food enough allowed them to keep up their strength.

DRESS.

The dress of Karen men, south of Toungoo, is a tunic, or frock, and a wrapper; the latter serving for a sheet to sleep in at night. Each one, too, usually carries a bag slung over his shoulder.

The tunics of different tribes and clans are distinguished by the peculiar embroidery of each.* The Sgau tunic has red horizontal parallel lines on a white ground. The Bghai tunic, on the contrary, has the red lines perpendicular. The Pgho tunic has a broad belt of embroidery at its base, and the Pahu tunic has a narrow band, and the figures varied for every village, originally distinct families, so the markings are equivalent to coats of arms.

One clan of the Bghais wear tunics, but by far the larger portion of the tribe wear pants, and no tunic; and all the tribes beyond them, as the Gaikho, Tarus, and Red Karens wear pants; but each tribe or clan has some variation in the stripes or figures worked on them, so that, like those who wear tunics, they can be distinguished at a glance.†

Excepting the Red Karens, all the women wear a short gown, petticoat, and large turban, all variously ornamented. The Red Karen women have corresponding articles of dress, but each one is merely a rectangular piece of cloth.

The dresses are made of cotton, which the women usually plant, gather, clean, spin into thread, and weave into cloth. The Northern Bghais and Gaikhos, who raise the silkworm, adorn their dresses with a profusion of silk embroidery.

In some of their clans, the Elder who officiates as high priest in their offerings, or sacrifices, has a longer and more ornamented tunic presented to him than ordinary, but nothing in their traditions has been found to explain the reason.

To describe the different modes of ornamenting their dresses, would require a long article by itself, and a series of drawings.

* There is one exception. The Mopghas wear the same tunic as the Tunic-Bghais, but why, no reason is known. They speak widely different dialects.

† There is one exception. The Northern Bghais, and the Gaikhos wear the same pants.

Tattooing is a practice quite foreign to all the Karen tribes, excepting the Red Karens, who are all tattooed across the back with a figure resembling the rays of the rising sun. They can give no account of the origin of the custom. Karens who are brought in contact with the Burmese and Talaings, often adopt their customs, so that Karens are often found, especially among the Pghos, tattooed and dressed like Burmans.

No characteristic mode of amusement has been observed. The Karens dance, wrestle, and show their agility much like the other nations around them.

Games of chance are not unknown to the people, but they are little addicted to them, and never bet on them, unless they have been corrupted by the Burmese or Shans.

Every village has a good complement of old people in it, and I have met with two men, who considered themselves a hundred years of age. Every village has persons over sixty, seventy is not uncommon, eighty is rare, but ninety is met occasionally.

No marked difference has been noticed between the sexes in respect to longevity.

SICKNESS.

Where diseases are not deemed contagious, ordinary attention is bestowed upon the sick by their friends and relatives; but when contagious diseases appear, like the small-pox, the whole population seems struck by a panic, and they abandon their houses and scatter into the jungles, where they build booths, and remain till they consider the disease to have passed away. They deem the cholera as contagious as small-pox, and though husbands and wives, parents and children will unite and watch each other to the end; yet all often run away, as soon as a person is dead, and leave him unburied. It is extremely difficult to get people buried in times of cholera.

The Karens attribute diseases to the influence of unseen spirits, and hence, to cure them, they resort to making offerings to appease the spirits that are supposed to be offended. They have twenty or thirty distinct names for different offerings that are made for the sick. They do not, however, exclude the use of medicine altogether; and the Karen Elders have a large *Materia Medica*, consisting of roots and

herbs, leaves and bark, to fall back upon when the offerings do not prove efficacious. •

From satisfactory statistics the annual death rate of the Mountain Karens has been ascertained as a little over two and a half per cent., or about the same as in London. The same years that these statistics were collected, the death rate among the acclimatized European soldiers in Toungoo, was only one per cent. The difference should be attributed, it is believed, to difference in constitution, difference in habits, and difference in treatment of the sick; and not to locality. The Karen Mountains appear as healthy as the Scotch Mountains, or the Mountains of Pennsylvania. That something does affect the death rate besides the locality, is manifest from the deaths in the Toungoo jail. The very years that one man only in a hundred was dying in Cantonments, from eight to seventeen in a hundred were dying in the jail.

Karens lack vigour of constitution, and therefore present a weak resisting power to disease. They are subject to intermittent fevers throughout life. I have prescribed to shivering infants at the breast and to shaking old men of threescore and ten. An European does not escape them, but he has a strong constitution, which struggles hard, and if it comes off victor, it is a victor for life. For the first four years of my jungle travels, I had fever every year, but for thirty years since, with one slight exception, I have been entirely exempt. Bites from land leeches often result in bad sores on Karens; while an European will sit down and pick off a dozen from his legs after a walk, without the slightest subsequent inconvenience. In some localities, there is a species of gad fly that bites severely, and its bite is often followed by an ulcer on a Karen; while I have had the backs of both my hands dotted all over with blood spots from their bites, without suffering anything beyond the temporary inconvenience.

The Karens are a dirty people. They never use soap, and their skins are enamelled with dirt. When water is thrown on to them, it rolls off their backs, like globules of quicksilver on a marble slab. To them, bathing has a cooling, but no cleansing effect. Dirt is death's half brother, and is the father of a host of skin diseases to which the Karens are subject. About half of them have the itch, and

many in the form of dreadful sores. Shingles, and fish-skin, and ring-worm are nearly as common as *psora*.

Many diseases, common to all nations, are much more fatal to Karens than to Europeans. The measles are as fatal as the small-pox in Europe, and the hooping cough often makes sad havoc among children. I have known more than twenty die of this disease in a small village of some two hundred inhabitants.

Consumption kills a few, dropsy more, dysentery many, and occasionally considerable numbers are reported to me as dying of fevers; and yet I have never met with a single case of fever among the Karens, that did not yield to medicine. Enlarged spleen is very common, and is sometimes fatal. Ulcers do not kill, but they are as common as skin diseases, and are in great variety.

There is a disease very prevalent among the Sgau tribes, in which large ulcers appear on the limbs. I have had patients brought to the towns, where they have been sent to the hospitals; and sometimes they have been slightly benefited; but in no case has a cure been effected by European treatment; and I have never found a Surgeon who understood the nature of the disease. One said: "It is not leprosy;" but I think it is a kind of leprosy. Another remarked on the cases submitted to his treatment: "I cannot help thinking there is something venereal in it." This the Karens uniformly deny, but I have certainly seen cases in which both legs were masses of what appeared to be incurable sores completely cured, by severe salivation administered by a Burmese doctor; which favours the idea of the venereal character of the disease; but I have seen others die under the same treatment. The disease is hereditary in most instances, but whenever an ulcer appears, the Karens consider it infectious, and will not have the patient in the same house with them. They insist on his living in a separate house, as much as they would a leper. The Burmese, however, do not consider the disease infectious, in which they are partly correct. The Bghais say it is a foreign disease, and some call it "the Paku disease," and others the "Burmese disease;" while the Burmese in some sections call it "the Martaban disease," and in others "the Toungoo disease."

Goitre is common on the hills in special localities. It abounds in one village on the granite mountains, while villages three hours' walk

distant are nearly exempt, though located on the same hills, with the same geological formation. Three or four days' journey beyond this, in an extensive region, where the rocks are exclusively secondary limestone, goitre is again found in excess, while other villages, on the same limestone range, are quite free from the disease. In neither of these districts has any metallic mineral been found. Still, there must be something special in the localities where it abounds to produce it; but what that is, remains to be discovered. All that can be said of it with certainty is, that it is a disease of the hills, for it is not found on the plains; nor did I ever meet with it on the hills in the Tenasserim Provinces. The Karens attribute it to the soil, and say that the disease is caught by eating beans, pumpkins, and other vegetables raised in the infected locality, and by drinking the water that runs through it. Their theory has probably some foundation in fact.

Fowls and hogs that the Karens raise, are occasionally attacked by a violent disease by which they die off as if they had the cholera; and buffaloes on the plains are subject to a like complaint.

WORMS.

Entozoa are very abundant. The round worm, *ascaris lumbricoides*, is often vomited up by Karens, both children and adults. The common tape worm, *tænia solium*, is a common inhabitant of the bowels, as are also thread worms, *ascaris vermicularis*.

DEATH.

When an elder among the Bghais, with a large number of descendants, dies, the people build a place in the hall for the deposit of the corpse, and they hew a coffin out of the body of a tree, and hew a cover for it, like the Chinese coffins.

The body lies in state three or four days, and during the time men blow pipes, and the young men and maidens march round the corpse to the music. At night, the piping is discontinued, and singing is substituted.

When the piping and marching is not going forward, the exercises are diversified by weeping and mourning; or by the men knocking pestles together, and others showing their dexterity by putting their hands or heads in between, and withdrawing them quickly before the missiles come together again.

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There is a disease very prevalent among the Sgau tribes, in which large ulcers appear on the limbs. I have had patients brought to the towns, where they have been sent to the hospitals; and sometimes they have been slightly benefited; but in no case has a cure been effected by European treatment; and I have never found a Surgeon who understood the nature of the disease. One said: "It is not leprosy;" but I think it is a kind of leprosy. Another remarked on the cases submitted to his treatment: "I cannot help thinking there is something venereal in it." This the Karens uniformly deny, but I have certainly seen cases in which both legs were masses of what appeared to be incurable sores completely cured, by severe salivation administered by a Burmese doctor; which favours the idea of the venereal character of the disease; but I have seen others die under the same treatment. The disease is hereditary in most instances, but whenever an ulcer appears, the Karens consider it infectious, and will not have the patient in the same house with them. They insist on his living in a separate house, as much as they would a leper. The Burmese, however, do not consider the disease infectious, in which they are partly correct. The Bghais say it is a foreign disease, and some call it "the Paku disease," and others the "Burmese disease;" while the Burmese in some sections call it "the Martaban disease," and in others "the Toungoo disease."

Goitre is common on the hills in special localities. It abounds in one village on the granite mountains, while villages three hours' walk

distant are nearly exempt, though located on the same hills, with the same geological formation. Three or four days' journey beyond this, in an extensive region, where the rocks are exclusively secondary limestone, goitre is again found in excess, while other villages, on the same limestone range, are quite free from the disease. In neither of these districts has any metallic mineral been found. Still, there must be something special in the localities where it abounds to produce it; but what that is, remains to be discovered. All that can be said of it with certainty is, that it is a disease of the hills, for it is not found on the plains; nor did I ever meet with it on the hills in the Tenasserim Provinces. The Karens attribute it to the soil, and say that the disease is caught by eating beans, pumpkins, and other vegetables raised in the infected locality, and by drinking the water that runs through it. Their theory has probably some foundation in fact.

Fowls and hogs that the Karens raise, are occasionally attacked by a violent disease by which they die off as if they had the cholera; and buffaloes on the plains are subject to a like complaint.

WORMS.

Entozoa are very abundant. The round worm, *ascaris lumbricoides*, is often vomited up by Karens, both children and adults. The common tape worm, *tænia solium*, is a common inhabitant of the bowels, as are also thread worms, *ascaris vermicularis*.

DEATH.

When an elder among the Bghais, with a large number of descendants, dies, the people build a place in the hall for the deposit of the corpse, and they hew a coffin out of the body of a tree, and hew a cover for it, like the Chinese coffins.

The body lies in state three or four days, and during the time men blow pipes, and the young men and maidens march round the corpse to the music. At night, the piping is discontinued, and singing is substituted.

When the piping and marching is not going forward, the exercises are diversified by weeping and mourning; or by the men knocking pestles together, and others showing their dexterity by putting their hands or heads in between, and withdrawing them quickly before the missiles come together again.

many in the form of dreadful sores. Shingles, and fish-skin, and ring-worm are nearly as common as *psora*.

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Before the burial, an elder opens the hand of the dead man and puts into a bangle or some other bit of metal, and then cuts off a few particles with a sword, saying: "May we live to be as old as thou art." Each one in the company goes through the same ceremonials, and the fragments gathered are looked upon as charms to prolong life.

When about to bury the corpse, two candles made of bees-wax are lighted, and two swords are brought. A sword and a candle is taken by the eldest son, and a sword and a candle by the youngest; and they march round the bier in opposite directions three times, each time they meet exchanging swords and candles. After completing the circuits, one candle is placed at the foot of the coffin, and the other at the head.

A fowl or a hog is led three times round the building in which the body is placed, and on completing the first round, it is struck with a strip of bamboo once; on completing the second round twice; and at the third round it is killed. If a fowl, it is killed by twisting its head off. The meat is set before the body as food.

Young people are buried in a similar manner, but with some abridgement of the forms.

When the day of burial arrives, and the body is carried to the grave, four bamboo splints are taken, and one is thrown towards the west, saying: "That is the east." Another is thrown to the east, saying: "That is the west." A third is thrown upwards towards the top of the tree, saying: "That is the foot of the tree;" and a fourth is thrown downwards, saying: "That is the top of the tree." The sources of the stream are then pointed to, saying: "That is the mouth of the stream;" and the mouth of the stream is pointed to, saying: "That is the head of the stream." This is done, because in Hades everything is upside down in relation to the things of this world.

The body is then buried, and the grave filled in without further ceremony, and when the top of the grave has been neatly smoothed off, a little fence of trellis work is built around it. Within this fence, boiled rice and other food is placed for the dead.

On returning from the grave, each person provides himself with three little hooks made of branches of trees, and calling his spirit to follow him, at short intervals, as he returns, he makes a motion as if hooking it, and then thrusts the hook into the ground. This is done

to prevent the spirit of the living from staying behind with the spirit of the dead.

After the funeral, the grave-digger washes his clothes, or the neglect to do so renders him unfortunate. Married children may dig the grave for a parent, but young ones are prohibited. They must hire some one to do the work, and give him five rupees.

FEAST FOR THE DEAD.

Like the Chinese, the Bghais make annual feasts for the dead, for three years after a person's death. The feast is made at the new moon near the close of August, or the beginning of September; and all the villagers that have lost relatives, partake in it.

Before the new moon, they prepare food, plantains, sugar-cane, tobacco, betel nuts, betel leaves, and other articles of consumption. A bamboo is laid across one angle of the roof of the room, and on it are hung up new tunics, new turbans, new petticoats, beads and bangles; and at the appropriate time, when the spirits of the dead are supposed to be present, having returned to visit them, they say: "You have come to me, you have returned to me. It has been raining hard, and you must be wet. Dress yourselves, clothe yourselves with these new garments and all the companions that are with you. Eat betel together with all that accompany you, all your friends and associates, and the long dead. Call them all to eat and drink."

After dark, all the people eat bread made of boiled rice beaten in a mortar. The bread is spread down, and the people are invited: "All who are hungry, eat bread here."

Next morning, the first day of the moon, which is deemed the proper feast day, the previous last day of the month being regarded as the day of preparation, all who have Kyee-zees hang them up, and beat them. Then they kill a hog, and make thirty bottles of bamboos. Into one bottle, they put honey, into another water, in a third whiskey, in a fourth salt, in a fifth oil, in a sixth chillies, and into the seventh tumeric. The other twenty-three are laid aside. Loopholes are made to each bottle through which a string dyed yellow is tied.

After setting apart the seven bottles that have been filled, the remaining twenty-three are filled with food indiscriminatively. Some with pork, some with boiled rice, some with bread, some with whiskey, and some with betel. When these are filled, rice bread is rolled

up in leaves, and the rolls piled up together ; and then a large basket of open work is woven, into which all these bamboo bottles and the rolls of bread are put.

When the rice and meat is cooked for the feast, after the above arrangements have been made, the food is placed on kyee-zees, or little bamboo stools, if they have no kyee-zees ; and they have to be very particular to spread out all the food at the same instant, lest some of the spirits of the dead, being delayed in eating, should be left behind by their companions.

So soon as the food is arranged on the tables, the people beat the kyee-zees and begin to cry, which they say is calling the spirits to come to eat. Each one calls on the particular relative, for whom he has prepared the feast, as father, mother, sister or brother. If a mother, he says ; weeping : " O prince-bird mother, it is the close of August, Oh ! It is the new moon in September, Oh ! You have come to visit me, Oh ! You have returned to see me, Oh ! I give you eatables, Oh ! I give you drinkables, Oh ! Eat with a glad heart, Oh ! Eat with a happy mind, Oh ! Don't be afraid, mother, Oh ! Do not be apprehensive, Oh ! "

After the weeping exercises are over, the spirits are supposed to have finished their repast, and then the people sit down to eat what is left.

More food is then prepared and put into the basket with the bamboo bottles, that the spirits may have food to carry away with them ; and at cock-crowing next morning all the contents of the basket, including the bamboo bottles, are thrown out of the house on the ground ; when the same scene of crying and calling on the spirits of the dead is repeated, as detailed above.

They do not weep long, because it is related that in ancient times a woman had a daughter, whom she loved much, and after her death she made this annual festival for her and wept long ; when a prophet reproved her, saying : " That is enough. Your daughter says : ' My companions have left me. They have all gone on before.' " Then the mother said : " Seize her for me," and the prophet attempted to grasp her, but he got only a single hem from her garment. Hence the people never weep long, that the departed spirits of their friends may not be left behind by their companions.

Contributions to Indian Malacology, No. VI. Descriptions of new land shells from the Nilgiri and Anamullay Hills, and other places in the Peninsula of India.—By W. T. BLANFORD, A. R. S. M., F. G. S.

[Received 3rd February, 1866.]

Of the shells described in the following pages, the greater portion were collected by Captain Beddome, Deputy Conservator of Forests, in the Madras Presidency. This is the case with all the shells from the Anamullay hills, and also the remarkable species of *Spiraculum* from the neighbourhood of Vizagapatam. The Nilgiri Hill shells were found by myself in a recent visit, and *H. intumescens* was given to me some years since by Mr. Theobald as *H. Bajadera*, Pfr. I have since collected the shell myself living at Mahableshwar.

1. SPIRACULUM BEDDOMEI, n. s.

Shell very broadly umbilicated, depressed, sub-discoidal, smooth, (?) solid, white with transverse chesnut zigzag stripes. Spire flat or sub-convex, suture deep. Whorls 5, rounded, the last cylindrical, descending gradually towards the aperture, and furnished, 7-10 millimetres behind the peristome, with a short open sutural tube, projecting forwards and upwards, not touching the penultimate whorl. Aperture diagonal, circular, peristome double, both lips continuous, the inner slightly expanded, curved back into a shallow angular sinus at the suture, the outer expanded, and inverted upon the upper and dextral margins, rising near the suture into a compressed wing, which is attached throughout on the left side to the penultimate whorl. Operculum horny, concave within, convex without, flattened near the centre, 2 or 3 outer whorls furnished with a free spiral testaceous lamelliform border.

	Millem.	Inches.
Major diameter,	27	1.12
Minor ditto,	23	.92
Height,	10	.4
Interior diameter of aperture, ..	8	.32

Habitat. Kimery Hills near Waltair (Vizagapatam), northern division of the Madras Presidency.

This species is of about the same size as *Sp. hispidum*, Pearson, which it closely resembles in many particulars, though differing in several essential characters. Of these perhaps the most remarkable is the forward direction of the sutural tube, which, in all the previously described species of *Spiraculum* (even if the Moulmein *Opisthoporus Fordoni*, Bens. be included), is retroverted. In several forms of *Opisthoporus*, however, the spiracle projects forward, as in the present species. The wing of *Sp. Beddomei* is much more distinct, higher and more pterocycloid than that of *Sp. hispidum*; the inner peristome, (which is deficient in the last named species), is angularly sinuate beneath the wing, but there is no approach to the deep sub-circular opening of the Indian species of *Pterocyclos*. All the specimens procured by Captain Beddome were dead and weathered, and had lost their epidermis, but the traces which remained, shewed no approach to the hispidity from which the Khasi hill shell derives its name. The operculum has even more resemblance to that of *Pterocyclos tenuilabiatum*, Metcalfe, than has that of *Sp. hispidum*.

This is the first discovery in the peninsula of India of a species of *Spiraculum*, that genus having hitherto only been met with to the east of the Bay of Bengal, in Assam and Burmah, while the sub-generic form *Opisthoporus* occurs in the Malay countries and Borneo. In a country like India, which intervenes between two great zoological provinces, the Malayan, and the Africano-Asiatic, such exceptional occurrences are natural, and instances are known not merely of outlying species, but of genera, such as *Cataulus* and *Cyclotopsis*, peculiar to the Indian peninsula or to Ceylon, though belonging to Malayan or African families. The presence of a *Spiraculum* on the eastern coast of India, is a parallel case to the existence of *Otopoma Hinduorum*, W. Blanf. in Hattiwari. It should also be noted that the discovery of specimens of the two Burmese helices, *H. Castra*, Bens. and *H. levicula*, Bens., on the hills of Orissa, shews that some few Burmese species even have extended their range down the western side of the Bay of Bengal.

2. NANINA (ARIOPHANTA) INTUMESCENS, n. s.

Shell sinistrorse, narrowly and sub-obtely umbilicated, globose, thin, finely, subplicately, transversely striated with obsolete decussating

sculpture, dull fulvous brown, horny, rather lighter in colour just above the periphery and around the umbilicus. Spire convexly conoid, apex very obtuse, suture scarcely impressed. Whorls $4\frac{1}{2}$, slightly convex; the last bluntly carinate, descending very little near the aperture, tumid beneath, compressed around the umbilicus. Aperture large, diagonal, truncately sub-circular; peristome white, sub-expanded, margins approaching each other, columellar margin nearly vertical, rather broadly reflexed, partly covering the umbilicus.

	Millem.	Inches.
Major diameter,	32	1.3
Minor ditto,	26	1.05
Axis,	22	0.9

Habitat. Mahableshwar. Western Ghats of Hindustan.

This fine species of *Ariophanta* has long been confounded with *Nanina Bajadera*, Pfr. which is, however, although a variable shell, easily distinguished. *N. Bajadera* is more globose and thicker, being at the same time more transparent, it has much stronger sculpture (and deeper sutures) and is always rounded at the periphery near the mouth, and frequently throughout, while in *N. intumescens*, the blunt angulation is persistent. *N. Bajadera* too has a fine vitreous lustre, while *intumescens* is dull, and the former shell is usually of a greenish olive colour, though varying in this character and sometimes resembling the latter. The animals also shew a difference in colour, that of *N. intumescens* is uniformly, so far as I have seen, dark cinerous, while that of *Bajadera* is much lighter, but very variable. The latter shell is found mostly on shrubs, the former on the ground, and while *intumescens* has as yet only been found at Mahableshwar, 4,500 feet above the sea, *Bajadera* (which is rare at Mahableshwar) abounds on the equally or nearly equally high hills of Singhur and Poorundhur, and along the summit of the Western Ghats at about 2,000 feet. It abounds at Khandalla at the top of the Bhore Ghat.

I have already mentioned, in a previous paper, (An. Mag. Nat. Hist. for February, 1863) that an examination of the type specimens of *N. Bajadera*, Pfr. and *N. ammonia*, Valenciennes, has shewed these two supposed species to be identical. I long doubted the distinctness of the species now described from *N. Bajadera*, but although

I have specimens of the latter from many different places, they are all easily distinguished from *N. intumescens*.

3. *N. (Hemiplecta?) SISPARICA*, n. s.

Shell openly perforated, subumbilicated, depressed, rather thin, striated, white with a yellowish brown epidermis, having a rather dull oily lustre. Spire convex, apex obtuse, suture flat, linear, submarginate. Whorls 4, very flatly convex above, apical whorl marked with very fine decussated plicate striation, the last not descending distinctly, but bluntly angulate above the periphery, convex beneath. Aperture oblique, semiovally lunate, white and pearly within, the breadth exceeding the height, peristome thin, margins distant, united by a thin callus, columellar margin very oblique, and triangularly reflexed close to the perforation.

	Millem.	Inches.
Major diameter,	37	1.5
Minor ditto,	31	1.3
Axis,	18	.75

Habitat. Sispara ghat, Nilgiri hills, S. India, rare.

I know of no near Indian ally of this species. *N. Orobia*, Benson, from Darjeeling, which approaches it in some respects, is more globose and more solid, and has impressed sutures. The Ceylonese *N. Chenui*, however, closely resembles the species above described in form, though it is easily distinguished by its peculiar impressed sculpture. I obtained but two specimens, one of which was living, near the top of Sispara ghat. It is remarkable that so fine a shell should have escaped detection before.

The animal differs in no essential character from those of the sinistorse *Ariophanta* section. It has a large mucus pore at the end of the foot without any lobe above, the mantle is of moderate size, the head and neck granulated, the caudal portion of the body marked by oblique parallel, impressed wrinkles, and broadly margined near the sole with a double, impressed line.

4. *N. (Macrochlamys?) HERESCENS*, n. s.

Shell scarcely perforate, inwardly depressed, yellowish or fulvous, thin, horny, dull, marked with very close microscopic impressed

oblique lines above, more polished and radiately striated below. Spire low, apex rather acute, prominent, sub-acuminate, suture deep. Whorls $5\frac{1}{2}$, rounded, the first narrow, the last much broader, very bluntly sub-angulate at the periphery, and tumid beneath. Mouth large, nearly vertical, lunately sub-ovate, breadth exceeding the height; peristome thin, straight, margins sub-distant, united by a very thin callus, columellar margin nearly vertical above, very briefly and broadly reflexed, nearly covering the perforation.

	Millem.	Inches.
Major diameter,	15	0.6
Minor,	$12\frac{1}{2}$	0.5
Axis,	$8\frac{1}{2}$	0.33

Habitat. Anamullay hills. S. India.

This species resembles the Bengal *N. subgesta*, Bs., and the Ceylonese *N. carneola*, Pir. (as figured by Reeve) in form, but has a duller lustre and deeper sutures, resembling in the latter character some of the Ceylon *Naninae* of the same section. The microscopic sculpture is peculiar, the impressed lines being very close, but somewhat irregular and wavy. They cause the dull appearance of the surface. An ordinary lens is insufficient to shew them: under a microscope with a $1\frac{1}{2}$ in. objective they are very distinct.

5. *N. (Macrochlamys?) LIXA*, n. s.

Shell obliquely perforate, rather depressly turbinate, very thin, fulvous, horny, dull, obliquely striated and marked with very fine and close impressed lines, also oblique, only visible under the microscope, polished beneath. Spire conical, apex acute, suture impressed. Whorls $5\frac{1}{2}$, convex, gradually increasing, the last much broader, obsoletely sub-angulate at the periphery, tumid beneath. Aperture nearly vertical, roundly lunate, breadth very little exceeding the height. Peristome thin, straight, margins sub-distant, columella nearly vertical and very briefly reflexed above, almost concealing the perforation.

	Millem.	Inches.
Major diameter,	$13\frac{1}{2}$	0.54
Minor ditto,	12	0.48
Axis,	$9\frac{1}{2}$	0.38

Habitat. Anamullay hills. E. side.

This is a shell with a similar dull greasy lustre to the last and owing it to the same cause, *viz*, microscopic sculpture. It is a well marked species. Very possibly, however, intermediate varieties may be found connecting it with *N. hebescons*.

6. *N. (Macrochlamys) INFAUSTA*, n. s.

Shell openly perforated, convexly depressed, very thin, fulvous horny, obliquely finely striated, spire convex, apex distinct, suture scarcely impressed. Whorls 6, flattish above, gradually and regularly increasing, the last not descending, depressed, swollen beneath, obsoletely sub-angulate above the periphery. Aperture oblique, lunate, breadth exceeding the height; peristome thin, margins distant, united by a very thin callus, columellar margin vertical above, briefly and triangularly reflexed.

	Milleim.	Inches.
Major diameter,	23	0.92
Minor ditto,	20	0.8
Axis,	12½	0.5

Habitat. Anamullay hills, S. India.

Three specimens of this species occur amongst Captain Beddome's Anamullay collections. The above dimensions are those of the largest and most perfect specimen. In both of the smaller specimens which measure respectively in their major and minor diameters and axis 19½, 18, 10, and 17, 15, 9 millimetres, there is more or less descent of the last whorl at the aperture, but both specimens have a stunted appearance, and irregular descent of the last whorl is very common in abnormal individuals of all forms of *Helix*.

This species has no very marked character. It is very near *N. vitrinoides*, Desh., but may be recognised by its smaller and rounder mouth, narrower last whorl and more convex form. In shape it resembles *H. monticola*, Hutton.

7. *VITRINA AURIFORMIS*, n. s.

Shell very depressed, irregularly ovate, ear-shaped, very thin, striated, polished, with a membranaceous epidermis, greenish or brownish yellow in colour, paler at the nucleus. Spire flat, suture slightly impressed. Whorls 1½. Aperture oval, occupying the whole under

part of the shell, and exposing the interior to the apex; peristome membranaceous.

	Millem.	Inches.
Length,	13	0.52
Breadth,	8	0.32
Height,	2½	0.1

Habitat. Sispara ghat, Nilgiri hills, Southern India.

This species is very near *V. gigas*, Bens. and still more closely allied to *V. Peguensis*, Theobald, being, however, a more depressed species than either, and more open. It is also less solid than the last named species. I have not met with the animal, which may possibly differ from those of other *Vitrinæ*.

If the animal resemble those of *V. gigas* and *V. Peguensis*, the occurrence of this mollusk on the western flank of the Nilgiri Hills will be one of the most anomalous with which I am acquainted amongst the land-shells of India, since I know of no other instance of a Malayan type, unrepresented on the Himalayas, of which species occur on the hills of Southern India. A small auriform shell such as this may, however, have been easily overlooked, and the Himalayan Molluscan fauna is, probably, far from thoroughly known.*

The animal of *V. Peguensis* has been partly described by Mr. Theobald who, however, has unfortunately not mentioned the form of the mantle, the presence or absence of lobes covering the shell, nor the existence of a caudal gland, unless by the expression "caudali papilla nulla" is intended to imply its absence; more probably Mr. Theobald's meaning is that the overhanging lobe, so conspicuous in some forms of *Nanina* is absent, the gland existing, as in *Ariophanta* &c.

This *Vitrina* is not the only south Nilgiri species. A larger membranaceous form also occurs, which requires comparison with Mr. Benson's *V. membranacea* from Ceylon.

8. ACHATINA ANAMULLICA, n. s.

Shell turrito-ovate, thin, finely striated, horny with high vitreous lustre. Spire turrited, sides convex, apex obtuse, suture impressed.

* Mr. Theobald (J. A. S. B. XXXIII. p. 244,) includes *V. gigas* in his list of Himalayan shells, but the species is found on the Khasi hills, the fauna of which differs widely from that of the Himalayas.

Whorls 8, scarcely convex, the last rounded beneath. Aperture oblique, peristome thin, columella moderately arcuate, obliquely truncated below.

	Millem.	Inches.
Length,	27	1.1
Diameter,.....	12	0.48

Aperture 10 millemetres high, $6\frac{1}{2}$ broad. Habitat. Anamullay Hills.

Intermediate in its characters between *A. Nilagarica*; Bens., and the oblong ovate, *Achatina* of Ceylon.

Captain Beddome's Anamullay collections comprise the following species in addition to those above described :—

Nanina vitrinoides, Desh. var.

N. Shiplayi, Pfr.

N. Indica, Pfr. var.

N. Travancorica? Bens.

N. Basilens, Bens.

N. ampulla, Bens.

N. auris? Pfr.

Bulimus Nilagaricus, Pfr. var.

B. physalis, Bens.

B. sp. near *B. trifasciatus*, Rv., one imperfect specimen.

Cyclophorus Jerdoni, Bens.

C. deplanatus, Pfr.

C. sp. near *C. ravidus*, Bens. (or possibly an immature *Aulopoma*.)

C. sp. (apparently near *C. Shiplayi*, Pfr., but finely costulated, possibly the young of an *Alycaeus*.)

Pterocyclos nanus, Bens.

Pt. rupestris, ?! Bens.

Paludomus, sp.

Neritina Perrotettiana, Recluz.

To which there only remains to be added *Cataulus recurvatus*, Pfr., to complete the list of known shells from the Anamullays. I add a few remarks upon the species above quoted.

But one specimen occurs of the shell which I am disposed to consider a variety of *Nanina vitrinoides*. It is small, measuring only $18\frac{1}{2}$ millemetres by 16 in its two diameters, and $8\frac{1}{2}$ in height. It is depressed in form, and of a greenish tinge, but appears to differ in no

essential particular from the Bengal variety. The species has not before, so far as I am aware, been found in Southern India. *N. Ship-layi*, Pfr. inhabits the eastern base of both the Anamullays and the Nilgiris; on the latter hills I have found it at the foot of the Coonoor ghat. The animal is a *Nanina*, closely resembling *N. indica*, Pfr. and *N. acuducta*, Bens., having a large mucus pore at the caudal extremity of the foot without an overhanging lobe, or with but a very rudimentary one. The mantle lobes are small, and the animal in all respects closely resembles that of the sub-genus *Ariophanta*. A solitary specimen of *N. indica* from the Anamullays is very solid and rather strongly marked, the sculpture being less regular than in the common Nilgiri form, and scarcely granulate, the last peculiarity being perhaps due to weathering, as the specimen is decorticate and somewhat bleached. It is a dwarf form, less depressed than the type, and measures 17 and 15 millem. in its two diameters, and 10 in height. The shells found on the Nilgiris vary considerably.

N. Basilens, Bens. (*H. Titanica*, Pfr.), I learn from Captain Beddome, is far from scarce in the teak forests of the Anamullays, a tract 2,000 to 3,000 ft. above the sea, where *N. ampulla*, Bens. also occurs. The range of the latter shell extends a considerable distance to the north in the Wynand district, where it was found by Dr. Jerdon, if not to the base of the Coorg hills, while *N. Basilens* does not appear to be found north of the remarkable gap in the Western Ghats at Paulghat cherry, which, traversing the very highest portion of the whole chain, divides the Nilgiris from the Anamullies, and through which the railway from Madras to Beypoor passes. Both *N. ampulla* and *N. Basilens* have only been found west of the Hills.

I have not had an opportunity of comparing the shell referred doubtfully to Mr. Benson's recently published *N. Travancorica* with the full description, and the identification is therefore unsatisfactory. The shell referred to *N. auris*, Pfr. is identical with a species found at Neddiwuttom on the Nilgiris, and corresponding closely with Reeve's figure of that *N. auris* in *Conchologica Iconica*.

The little shell which I have called *Bulimus Nilagaricus*, I was at first disposed to consider a distinct species. It is only 14 millem. in length, and base by 6 in diameter. But some specimens from the Nilgiris are no larger, and there are graduations in size from these to

the typical shells. The solitary specimen of *B. physalis* has only traces of spiral sculpture, but it appears to agree in every other respect with Mr. Benson's description.

A dwarf form of *Cyclophorus Jerdoni*, only 29 millem. in diameter and 19 high, and 2 species of *Pterocyclos*, one of them unquestionably identical with *Pt. nanus*, Bens., are also comprised in Captain Beddome's collections. The second species of *Pterocyclos* of which a single weathered specimen was found, shews no essential distinction from the Bengal *Pt. rupestris*, Bens., but it appears improbable that that form should really exist so far to the south.

Cyclophorus deplanatus, Pfr. some decorticated specimens of which were amongst the Anamullay shells, occurs abundantly on Sispara ghat, at the western extremity of the Nilgiri plateau. A small shell in Captain Beddome's collections, with more colouring than *C. ravidus*, Bens., and ornamented with zigzag transverse stripes, may possibly be a young specimen of that species, but its thin and continuous peristome recalls that of some forms of *Aulopoma*, and the possibility of its belonging to that genus is strengthened by the deficiency of the epidermis close to the peristome. As the Anamullays have already furnished a *Cataulus*, the occurrence of a species of *Aulopoma* is by no means improbable.

The *Paludomus* is perhaps a variety of the species common near Bombay. The little *Neritina Perrotettiana* was previously unknown except in the Pykara river on the Nilgiris.

We have evidently, as yet, only an instalment of the molluscan fauna of the Anamullays. None of the shells above specified are from the higher ranges. So far as they have been collected, there is, as might have been anticipated, a general identity with Nilgiri shells, but at the same time a somewhat closer approximation to the Cingalese fauna.

P. S.—The above paper was written six months ago, and would have been sent for publication in the Society's Journal at once, but that I hoped to be able to procure drawings of the shells for the purpose of illustrating it. In this, I have again been disappointed, and I am compelled to forward the descriptions of the shells by themselves.

In the meantime, however, I have received from Captain Beddome several additional shells from the Anamullay hills collected by him

during the past year. Besides several new species, the collection comprises *Helix Anax*, Bens., and a fine large *Nanina* resembling *N. Cysis*, Bens. but dextrorse, and which is very possibly a large variety of Mr. Benson's *H. Basilella*. It occurred at a height of 7,000 feet above the sea. I append descriptions of 3 of the new species sent.

9. ACHATINA BEDDOMEL, n. s.

Shell turrito-ovate, solid, finely and closely sub-costulately striated, dark purplish brown, epidermis in parts having a tendency to assume a dirty cream colour, especially in dead specimens. Spire convex below, slightly acuminate above, apex obtuse, rather inclined to the right, suture impressed. Whorls $7\frac{1}{2}$ -8 convex, the last $\frac{2}{3}$ of the entire length, rounded at the base. Aperture nearly vertical, sub-pyriform, milky within; peristome thickened, white, outer margin rather straight, not arcuate, columella deeply curved, lined with callus, sub-obliquely and rather broadly truncated at the base.

	Millem.	Inches.
Length,	30	1.2
Diameter,	$11\frac{1}{2}$	.45

Aperture 10 millem. long, 6 broad.

Habitat. Anamullay Hills, 5,000 to 7,000 feet (Beddome.)

This is a more solid form than any of the Nilgiri species, and it differs from all of them, and also from the solid Ceylonese forms, in its sub-acuminate apex. It is a well marked species.

10. ACHATINA TEXTILIS, n. s.

Shell ovate-oblong, rather solid, translucent, striated near the suture, smooth, polished, dark chesnut with close vertical and horizontal lines of a greyish yellow colour, varying in breadth and resembling the threads of an irregularly woven cloth. Spire elongated, conoidal with convex sides, apex obtuse, sutures impressed. Whorls 7, convex, the last about $\frac{2}{3}$ of the entire length, rounded beneath. Aperture vertical, truncately semioval, milky within; peristome slightly thickened, white, right margin slightly sinuate toward the base, columella deeply curved, obliquely truncated beneath, margins united by a thin callus.

	Millem.	Inches.
Length,	26	1.05
Diameter,	13	0.52

Aperture $10\frac{1}{2}$ millem. long, 7 broad.

Habitat. Anamullay Hills, 6,000 feet, (Beddome.)

This is the only indigenous Indian *Achatina* with which I am acquainted, possessing coloured markings. In form it approaches some of the Ceylon *Achatina*, and also an undescribed Deccan species.

11. *BULIMUS TRUTTA*, n. s.

Shell perforated, conically ovate, thin, finely striated, light yellowish, with two spiral rows of sub-distant chesnut spots, sub-quadrate in form, on all the whorls, and two spiral chesnut stripes, the lower sometimes very faint, upon the last whorl below the periphery. Spire conical, apex acute, sutures impressed. Whorls $5\frac{1}{2}$, convex. Aperture nearly oval, slightly oblique. Peristome thin, margins united by a thin callus, columellar margin vertical, narrowly reflexed, the reflexed portion meeting the penultimate whorl at an angle.

	Millem.	Inches.
Length,	14	.55
Diameter,	9	.35

Aperture 7 millem. long, $4\frac{1}{2}$ broad.

Habitat. Anamullay Hills, (Beddome.)

There is some doubt whether the shells above described be adult. They have a somewhat immature appearance, but all the specimens sent, four in number, are of precisely the same size, and the thin peristome is characteristic of the group of *Bulimus Bengalensis*, to which the present species belongs. From that species and its allies, it is easily distinguished by its short conical form.

Catalogue of the specimens of Meteoric Stones and Meteoric Irons in the Museum of the Asiatic Society of Bengal, Calcutta, corrected up to January, 1866. By Dr. STOLICZKA and H. F. BLANFORD, Esq. F. G. S.

Number.	Date of fall.		Name of locality and geographical situation.	Weight.*	
	Year.	Month and day.		Of the largest specimens.	Of the specimens in the Museum.
1.—METEORIC STONES.					
1	1492	7th Nov.	Ensisheim, Elsass, France, ...	...	1 oz. 44 grs.
2	1798	13th Dec.	Benares (near Krakhut) East Indies, ...	...	1 oz. 347 grs.
3	1803	8th April,	L' Aigle (Dept. de l' Orne) France, ...	...	1 oz. 434 grs.
4	1807	14th Dec.	Weston, Connecticut, U. S. A. (2 specimens,) ...	...	111 grs.
5	1808	22nd May,	Stannem (near Iglau) Moravia, ...	...	5 oz. 228 grs.
6	1808	?	Moradabad, East Indies,§ ...	...	287 grs.
7	1812	5th August,	Chantonnay, Vendée, France,...	...	2 oz. 319 grs.
8	1814	15th Feb.	Bachmut, Yekaterinoslaw, Russia, ...	...	4 oz. 13 grs.
9	1815	18th Feb.	Duralla, territory of Patyala, East Indies,†	...	3 oz. 407 grs.
10	1821	15th June,	Juvenas near Libonnez, Ardèche, France, ...	...	3 lb. 13 oz. 42 grs.
11	1822	30th Nov.	Bittoura 75 miles N. W. of Allahabad, East Indies,†	...	1 oz. 108 grs.
12	1822 or 23	...	Umbalah, East Indies, ...	...	4 oz. 234 grs.
13	1827	16th Feb.	Mhow, Ghazeepore, East Indies,†	...	304 grs.
14	1838	18th Feb.	Akburpore, Sarahanpore, Eas Indies,†	...	67 grs.
15	1838	6th June,	Chandakapoor, Berar, East Indies, ...	...
16	1838	13th October,	Cold Bokkeveldt, Cape of Good Hope, ...	...

* Weights are given in pounds, ounces and grains.

Note 1.—Specimens with a mark † are besides represented by a cast of the entire stone in addition to the specimens of the original.

Note 2.—Specimens with a mark ‡ are represented by a cast only.

§ According Mr. Piddington the Society possessed in 1845 3 pieces of this interesting meteorite.

Number.	Date of fall.		Names of locality and geographical situation.	Weight.	
	Year.	Month and day.		Of the largest specimens.	Of the specimens in the Museum.
17	1841	12th June,	Château Renard, Loiret, France,	5 oz. 328 grs.	5 oz. 328 oz.
18	1843	25th March,	Bishopville, S. Carolina, U. S. A. (2 specimens,)	160 grs.	223 grs.
19	1843	6th July,	Manegaon, Kandeish, East Indies, (2 specimens,)	268 grs.	1 oz. 67 grs.
20	1846	Found in the Society's collection.	Assam, East Indies, ...	10 oz. 96 grs.	10 oz. 96 grs.
21	1847	27th Feb.	Iowa, Linn County, U. S. A.,	6 oz. 426 grs.	6 oz. 426 grs.
22	1850	30th Nov.	Shalka, 10 miles S. of Bancoorah, East Indies, (several specimens,)	2 lbs 15 oz. 100 grs.	5 lbs. 7 oz. 140 grs.
23	1852	23rd Jan.	Nellore near Madras, East Indies,†	...	...
24	1852	4th Sept.	Mezö, Madaras, Marasch, Transylvania,	15 oz. 348 grs.	15 oz. 348 grs.
25	1852	2nd Dec.	Bustee, (between Goruckpore and Fyzabad,) East Indies,†	...	...
26	1853	6th March,	Segowlee, Sarun, East Indies, (3 specimens,)+	8 lbs 11 oz. 266 grs.	19 lbs. 1 oz. 611 grs.
27	1855	5th August,	Petersburgh, Lincoln country, Tennessee, U. S. A., ...	42 grs.	42 grs.
28	1857	28th Feb.	Parnallee, S. of Madura, East Indies,†...	...	...
29	1860	28th March,	Kheragur, N. of Bhurtpoor, Agra, East Indies,	4 oz. 412 grs.	4 oz. 412 grs.
30	1860	14th July,	Dhurnsala, Punjab, East Indies, (2 specimens,)	15 oz. 306 grs.	1 lb. 7 oz. 66 grs.
31	1861	12th May,	Goruckpore (Pijsnaisi), East Indies, (3 specimens),†	10 lbs. 12 oz.	||
32	1863	11th August,	Dacca (Shytaal 40 m. N. of) East Indies, (several specimens),†	10 lbs. 6 oz. 12 grs.	11 lbs 2 oz. 380 grs.
33	...	...	Shergotty, ...	31 lbs. 9 oz. 259 grs.	31 lbs. 9 oz. 259 grs.
34	...	...	Jessore,† ...	...	...

|| The total weight at the fall was somewhat exceeding 5 lbs. 1 oz. 313 grs.

† The total weight of the original specimens which are as yet undistributed.



1866.]

Catalogue of Meteoric Stones and Meteoric Irons.

45

Number.	Date of fall.		Names of locality and geographical situation.	Weight.		
	Year.	Month and day.		Of the largest specimens.	Of the specimens in the Museum.	
2.—METEORIC IRONS.						
1	1776		Krasnojarsk, Teniseisk, Siberia (Pallas-iron,) (2 specimens.)	...	324 grs.	1 oz. 95 grs.
2	1784		Toluca, Xiquipilco, Mexico, (2 specimens,) ...	...	11 oz. 71 grs.	17 oz. 139 grs.
3	1792	Found,	Zacateras, Mexico, ...	...	1 oz. 87 grs.	1 oz. 87 grs.
4	1811		Ellbogen, Bohemia, (2 specimens.)	...	310 grs.	1 oz. 66 grs.
5	1814	Disc.	Texas, Red river, U. S. A., ...	...	18 oz. 180 grs.	18 oz. 180 grs.
6	1815	Found.	Lénarts, Scharosch, Hungary, ...	...	2 oz. 342 grs.	2 oz. 342 grs.
7	1827	Found,	Atacama, Belivia, S. A., ...	...	3 oz. 276 grs.	3 oz. 276 grs.
8	1840		Coke Country (sevier-iron), Tennessee, U. S. A.,	...	188 grs.	188 grs.
9	1840		Smith Country, (Carthago) Tennessee, U. S. A.,...	...	239 grs.	239 grs.
10	1841	Found.	Kuffs Mountain, Lemington Country, U. S. A.,	...	244 grs.	244 grs.
11	1843		Arva, Hungary (2 specimens,) ...	...	1 oz. 207 grs.	1 oz. 207 grs.
12	1847	14th July,	Braunau, Bohemia, ...	...	7 oz. 29 grs.	7 oz. 29 grs.
13	1847	Disc.	Seelaesgen, Neumark, Brandenburg, Prussia, ...	...	5 oz. 284 grs.	5 oz. 284 grs.
14	1850		Tucson, Onora N. Mexico, ...	...	385 grs.	385 grs.
15	1856		Tewall Hill, Madison Country, N. Carolina, U. S. A.,	...	2 oz. 31 grs.	2 oz. 31 grs.
16	1857		Tula, Netschaévo, Russia, ...	...	4 oz. 420 grs.	4 oz. 420 grs.
17	1861		Robertson Country, Tennessee, U. S. A.,	...	1 oz. 249 grs.	1 oz. 249 grs.
18	1861	Disc.	Bittersgrün, Saxony, ...	...	10 oz. 232 grs.	10 oz. 232 grs.



Observations on the Astronomical points determined by the brothers Schlagintweit in Central Asia.—By Captain GOLUBIEF.*

From the Journal of the Imperial Russian Geographical Society. Part 4th, 1861.

[Received 11th January, 1866.]

During the current year, the first volume of the Narrative of the Scientific Expedition of the brothers Schlagintweit to India and High-Asia, extending over a period of four years, from 1854 to 1858, has made its appearance. This remarkable production is all the more valuable, inasmuch as it will not only embrace the results of the explorations of the brothers Schlagintweit, but likewise those of many learned travellers who were their predecessors in this field of inquiry. The first volume contains a collected series of astronomical and magnetic determinations. The number of the points for which geographical co-ordinates are given is 112, but the degree of their exactness differs considerably. Many of the points for which co-ordinates are given were obtained from Indian triangulations; but many others were determined from march-routes alone. The determinations which are less exact, belong naturally to the northern portion of the journey, to Tibet and Turkestan. The corrections which it would be necessary to make in the existing maps, in consequence of the Schlagintweits' determinations, would be very considerable, particularly in longitudes. Thus, for instance, Lé, in Ladak, is alleged to lie 44' more to the West than was originally supposed, and altogether the whole of western Tibet would have to be removed about 20' to the westward. The changes in the latitudes are less extensive, the highest do not exceed 10', as in the case of Balti. The Karakoram pass, the highest point attained by Europeans who had preceded the Schlagintweits, lies more northwards by 11', and the same distance farther to the West than marked on any previous map.

* This paper was read at a general meeting of both sections of the Russian Geographical Society. The president of the section of physical geography, M. Seménof, who had only just returned from abroad, took occasion to express his own doubts as to the correctness of some of the determinations and conclusions of the brothers Schlagintweit. He communicated to the members present that these results, which bear evident traces of haste, are regarded with equal doubt by the learned in Germany. The extensive range of the labours, the multiplicity of the collections and observations which devolved on the celebrated travellers, produced the confusion and irregularity apparent in their observations and collections.



The weight which is to be attached to these corrections, must depend on the degree of exactness which regulates the scientific labours of the brothers Schlagintweit; but unfortunately, in the volume that has been issued, this consideration is not dwelt on, that is to say, the probability of errors in the determinations is nowhere alluded to. The determinations themselves are not particularised minutely enough, to enable us to estimate their value.

In order to judge of the correctness of these labours, we bring forward some examples. Thus, in the determinations of Lé in Ladak, the error which should be expected in the latitude would amount to 30". The longitude of Lé was determined by the transfer of one chronometer which was rated at Simla on the 15th May, at Lé on the 17th September, at Srinagar the 24th October; the longitudes of Simla and Srinagar are known. The rate of the chronometer should have been deduced from the longest transfer occupying 162 days, from which, in the main result, a considerable error was to be expected† amounting to no less than 7'.5. Further an error has crept into the calculations of the brothers Schlagintweit which, when corrected, will alter their result by 8' (instead of 77° 14' 6" it should be 77° 22' 5" east of Greenwich). The correction of the chronometer was determined on the Karakoram pass on the 9th of August; by its action from Simla (15th May) to Srinagar (24th October) the longitude of the pass was determined at 77° 30' 4". But corrections of the chronometer at Lé were also obtained on the 11th July and 17th September, according to which the determinations of the Karakoram pass is found to be 77° 39' 5" or, otherwise, differing by 9'.

* The latitude of Lé was determined twice by polar heights.

11th July,	34° 7'5
16th September,	34° 9'2
Mean,	34° 8'3
According to Cunningham,	34° 9'1
Moorcroft,	34° 9'3

† The chronometer was rated in the Observatory of Calcutta in March, 1855 and April, 1857 (pp. 98 and 102). From this it must appear, that the probable 24 hourly disturbance of the chronometer on the spot would not be less than $\pm s$. In the longitude of Lé, also, one can suspect an error of at least $\frac{\pm s \cdot 125.37}{162} = \pm 29s$. From Simla to Lé is a journey of 125 days, from Lé to Srinagar 37 days; whole duration of the journey 162 days.

But the Schlagintweits express their doubts as to the correctness of the determination of time at Lé on the 11th July, and, therefore, do not take it into account. Nevertheless, an error of no less than 10' must, in all probability, be suspected in the longitude of the Karakoram pass as well as in the longitude of Lé. It remains, consequently, open to doubt, which longitude is to be accepted, that given by the Schlagintweits, or that previously adopted by Humboldt, which Thompson, who visited this pass in 1848, found to be quite accurate. Up to this point, the corrections are less than $\frac{1}{2}^{\circ}$, and applied to the map attached to the description of their journey, they excite curiosity, but not surprise; but the upper portion of the map representing Central Asia puzzles every one, by its marked difference to every thing that has hitherto been known of these countries. It is sufficient to say that the position of the three bases of the cartography of this part of Asia, namely the towns of Khotan, Yarkand and Kashgar, disagrees with those hitherto generally accepted, by nearly 180 versts, for all the three points nearly equally lie 10' in latitude, and 130' in longitude, more southward and westward, according to the dictum of the Schlagintweits.

At the same time, the determinations of little Bokhara, which belong to the Jesuits, cannot call forth strong doubts; on the contrary, there is strong reason for believing, that if these determinations are not altogether correct, they are but very slightly incorrect. In Djungaria, there are several points determined by the Jesuits, and some subsequently by me in 1859. From a comparison of these determinations, it becomes evident that the latitudes given by the Jesuits are correct to a minute. But the astronomical observations in Djungaria were, in all probability, not made by the Jesuits themselves, but by Chinese whom they had instructed. It must therefore be supposed, that the points in little Bokhara, where the Jesuit fathers worked themselves, are equally correct. As regards the longitudes, it is well known that the existing itineraries coincide perfectly well with the determinations of the Jesuits, though it must be acknowledged that the marche-routes having almost a meridional direction, cannot point out any appreciable error in the longitudes. Generally speaking, the better acquainted we become with Chinese Turkestan, the more convinced we are of the accuracy of the determinations of the Jesuits.

In support of this, we shall here bring forward the following example. There are two routes, besides others, across the Tian Shan leading to little Bokhara; one from Kuldja to Aksu, the other from the southern shore of Lake Issyk-kul by way of the Faükù pass, to Ush. Until the astronomical labours of 1859, both these routes presented on the map considerable angles with the axis of the mountain range; the first one of nearly 45° , and the other that of 30° , but according to the astronomical results obtained in 1859, it was found that the inclination of routes from Kuldja to Aksu, to the axis of the range, did not exceed 30° , while the route to Ush intersects the ridge in a direct line, and runs north and south. It appears strange then after this, if, seeing the great inclination of the transverse routes to the axis of the mountains, that Issyk-kul, with the neighbouring countries on the northern side of the Tian Shan, had not been before removed to the west, as was done subsequently in consequence of the astronomical determinations; or that all the series of points in Little Bokhara were not removed to the east, and in every case not to the west. Facts like these, speak in favour of the positions of Ush and Askus, and other towns of Little Bokhara determined by the Jesuits; and it must be observed, that up to the present time no one has had the same means, as possessed by them, of determining the relative positions of these towns. The last point that the Schlagintweits determined instrumentally, is Suget, a halting place for caravans, proceeding from Ladak to Yarkand. This route is marked on a very rare map, which is a direct copy of an original one compiled by the Jesuits and translated by Klaproth; a point on this road under the same latitude with Suget, as determined by the Schlagintweits, has nearly one and the same longitude. Beyond Suget, all the other points on the Kuen-lun and in Turkestan, are determined by the marche-routes; the most northern of these and nearest to Khotan, which the two brothers Herman and Robert succeeded in reaching, is the village of Bashia. This point is also given on the map of the Jesuits, its position being fixed by marche-routes, not by direct determination. The difference in the positions of Bashia, as given by the Jesuits and the brothers Schlagintweit, amounts to $6'$ in latitude, and $47'$ in longitude. How is it then possible, after this, to accept the position of Khotan, and with it that of the other towns of Turkestan, as given by the Schlagintweits,

differing as it does by 130' in longitude from the astronomical determinations of the Jesuits, when neither Herman nor Robert visited Khotan, while the papers of Adolph perished with him in Kashgar?

But how are we to regard the more recent labours in the country adjoining Little Bokhara, which cannot be reconciled to the points of the Schlagintweits?

Thus Sarry-Kul, the source of the Amu, which was determined by Wood, the Schlagintweits could not place on their map, according to the determination of Wood, but were obliged to remove it nearly 2° to the westward.

Issyk-kul is also marked on the map 2° more to the west than it should be, according to the last Russian astronomical determinations in 1859. And if this Lake be marked in its true position on the map of the Schlagintweits, Sarry-kul would then fall back on Yarkand, and the western extremity of Issyk-kul will appear above Asku, which, of course, would be impossible.

Petermann, in his notice of the labours and researches of the Schlagintweits, is of opinion that a review of their determinations in Little Bokhara is premature, more especially as the marche-routes by which they were guided, are not yet published. But the astronomical results of 1859, which so distinctly contradict the determinations of the Schlagintweits, belong to the Russian Geographical Society, and this is our excuse for expressing our doubts of the correctness of a certain portion of the results of the brothers Schlagintweit, before receiving the data on which they are based.



Comparative, hypsometrical and physical Tableau of High Asia, the Andes, and the Alps.—By ROBERT DE SCHLAGINTWEIT, Professor at the University of Giessen.

- Contents.*—I. *Geographical configurations.* 1. Plateaux. 2. Passes
3. Peaks.
II. *Hydrography.* 1. Lakes. 2. Springs.
III. *Physical phenomena.* 1. Snow-fall. 2. Snow-line.
3. Glaciers.
IV. *The varieties of habitation.* 1. Towns and villages.
2. Pasture grounds.
V. *Extreme heights visited by man.* 1. Mountain-ascents.
2. Balloon-ascents. 3. Effect of height.
VI. *Limits of vegetation and animal life.*

Remarks.—1. Drawings of many of the objects (plateaus, peaks, towns, &c.) mentioned in this Tableau, as well as panoramic profiles and maps, are contained in the Atlas to the “Results of a scientific mission to India and High Asia,” by Hermann, Adolphe, and Robert de Schlagintweit.

2. The heights, given in English feet, are absolute, referring to mean sea-level.

Transcription.—Vowels and diphthongs sound as in Italian and German: $\text{ä} = \text{u}$ in “but;” $\text{â} = \text{an}$ in the French “gant;” $\text{ü} = \text{ü}$ in German.—Consonants as in English. The sign ‘ marks the syllable to be accentuated.

The materials, upon which this comparative tableau is based, are: For *High Asia*, viz.—The Himálaya, Western Tibet, the Karakorúm and Künlün, our own travels and observations, combined with the valuable data of the Great Trigonometrical Survey of India, and with those of our predecessors.

For the *Andes*.—The celebrated “Voyages aux régions équinoctiales,” by Alexander de Humboldt, which possess to this day the highest value and importance; in his recent publications,* the newest contributions of science have been added with a master’s hand.

* Kosmos.—Ansichten der Natur, 3rd edition.—Kleinere Schriften.—I always quote the original, German edition.



For the *Alps*.—The two volumes “*Untersuchungen über die physikalische Geographie und die Geologie der Alpen*,” published by my brothers Adolphe and Hermann.

I. GEOGRAPHICAL CONFIGURATIONS.

1. Plateaux.

Plateaus, in consequence of their being more or less intersected by deep and broad valleys, or from being covered with ridges, are so variable in their form, that the use of the name, in many instances, appears to be somewhat arbitrary. I prefer not to extend the meaning of the name too far, and in so doing diverge from the practice of earlier travellers, who commonly applied the term to every mountainous region of great *general* elevations—as the natives of the *Himálaya* have a tendency to do—irrespective of its form.

In the *Himálaya*, which is composed in almost every direction of lofty and irregular ridges, and intersected by numerous valleys of inconsiderable width, no plateau of any extent has been discovered as yet, nor is it at all probable that one exists.

Western Tibet was for a long time supposed to be little else than a country of plateaux—an erroneous impression emanating from the first observers, though Humboldt had early pointed out the error of this belief,* as well as later travellers (the Stracheys, Cunningham, and Thomson). Plateaux² certainly do occur in Tibet; they are, however, much less numerous and considerably smaller than I had been led to expect. In *Bálti*, the plateau *Deosái* is 14,200 ft. high.

Between the *Karakorúm* and *Künlün*, especially near the western crest of the former, several well-defined plateaux of extraordinary height occur. Some of the highest are called: *Dápsang* (17,500 ft.), *Búllu* (16,883 ft.), *Aksái Chin* (16,620 ft.), and *Voháb* (16,419 ft.) In summer, no snow covers these plateaux, but also no vegetation: in the far distance there are some isolated, lofty, snowy peaks, besides which the eye discerns nothing but barren rocks, and extensive sterile plains, all well watered by streams, to which the glaciers covering the flanks of the peaks afford an ample and lasting supply. If water was wanting to these plateaux, they would be a complete desert, as uninhabitable to man as to any animal.

* *Ansichten der Natur*. Vol. I., p. 104.

In the *Andes* are to be found, if not the highest, at least the most extensive plateaux of our globe, which generally lie along the very ridge of the mountains, and on which large towns are situated, as Cerro de Pasco (14,098 ft.), Potosi (13,665 ft.), and Cuzco (11,380 ft.). There is also a large plateau surrounding the elevated lake Titicaca (12,843 ft.).

In the *Alps*, plateaux occur only at their base; the Swiss plateau having a mean height of 1,460 ft., the Suevo-Bavarian plateau of 1,420 ft.

2. Passes.

The mean of a sufficient number of such passes, which lead over the *principal crests*, is particularly to be taken into consideration, it being approximatively proportional, or, to express it more clearly, equal to the general mean height of these crests. The passes situate in the lateral ramifications of the principal crests—though they are numerous—cannot be included in these general means, being geographically of subordinate importance.

The mean height of passes in the three principal mountain-chains of *High Asia* is as follows:

A. *For the Himálaya* (mean of 19 passes,)..... 17,800 ft.

From Síkkim to Kishtvar: Bhután and Kashmír being excluded: the former for want of materials, and Kashmír on account of the Himalaya there losing the character of one well-defined and predominant chain.

B. *For the Karakorúm* (mean of 3 passes,)...18,700 ft.

From long. E. Gr. 76° to $79\frac{1}{2}^{\circ}$, the heights in the eastern continuation being quite unknown.

C. *For the Künlün* (mean of 2 passes,) 17,000 ft.

As the two passes are situated in parts not differing in any particular from the general mean of this chain, they may be looked upon as representatives of the other.

From these numbers it appears, that the Karakorúm has by far the greatest mean height of passes; but the one pass which we must still consider the highest, is situated in the Himálaya. This is the *Ibi Gámin pass* (20,459 ft.) leading from Gärhvál to Gnári Khórsum, which my brother Adolphe and I myself crossed as the first, and as yet as the only Europeans, Aug. 22, 1855. The pass next in height

is the Mustágh pass in the Karakorúm chain (19,019 ft.), the third the Changchénmo, or Yéngi Daván (about 18,800 ft.), in the same chain. None of these passes are generally used as commercial roads. The highest pass as yet known to be regularly crossed with horses and sheep, for the purposes of commerce, is the Párang pass (18,500 ft.; Mr. Theobald, Jr. makes it 19,132 ft., which seems too high—); and between this height and 18,000 ft. are situated several of the most important and frequented passes, as the Mána (18,406 ft.) the Karakorúm (18,345 ft.) and the Kióbrang (18,313 ft.). The lowest passes in the Himálaya chain are the Shínku La (16,684 ft.) and the Bára Lácha (16,186 ft.); the well known Niti pass reaches 16,814 ft.

In the *Andes*, the general mean elevation of the passes is, according to Berghaus :

For the Western Andes, 14,500 ft.

For the Eastern Andes, 13,500 ft.

The highest passes are : Alto de Toledo (15,590 ft.), Lagunillas (15,590 ft.), and Assuay 15,526 ft.). The latter pass attains, according to Schmarda, only 14,517 ft.

In the *Alps*, the mean of the passes is 7,550 ft.

The highest pass, at least in former times not frequently used for commercial purposes, is the St. Théodule (11,001 ft.), upon which the brothers Platter have now erected a meteorological observatory.

3. Peaks.

In the beginning of this century, the Andes were supposed to contain the highest peaks on our globe, and Chimborazo to rise supreme above the rest. Though as early as 1816 this was proved by Captain Webb's measurements to be incorrect, yet some time elapsed, before the superiority of the *Himálaya* above the Andes was generally admitted. Now we know, from the valuable and accurate observations of the G. T. Survey of India, that Gaurisáňkar, or Mount Everest (29,002 ft.) is the highest peak of the world. The memoir of Major J. T. Walker in the Journal of the Asiatic Society of Bengal, 1862, No. I., pp. 32—48, gives a detailed enumeration of the peaks hitherto measured in the Himálaya; this memoir, as well as the publications of Captain Montgomerie and private communications kindly received from the Surveyor General's Office, enable me to state, that 216 peaks are now accurately measured in the chain of the Himálaya. Among

these 216 peaks, 17 exceed the height of 25,000 ft., 40 the height of 23,000 ft., and 120 the height of 20,000 ft.

In the *Karakorúm*, peaks have lately been discovered, which are scarcely inferior in height to the loftiest in the *Himálaya*, though only its western part has as yet been explored. With regard to the heights of its eastern continuation, there is not enough known to allow even of an estimate being made.

The highest peaks of the *Karakorúm* are the *Dápsang* (Ko of the G. T. S. 28,278 ft.), the *Diámar*. (26,629 ft.), and the *Masheribrúm* (25,625 ft.)

With reference to the *Künlün*, we can only mention the peaks that we saw and measured between the *Yurungkásh* pass and the western termination of this chain; our idea about the general height is the more limited, as we have not even itinerary reports of former travellers to assist us. None of the peaks seen there by ourselves exceeds 22,000 ft.

In the *Andes*, important alterations have very recently been made with reference to the succession of the peaks, when arranged according to height, and, even now, the same amount of accuracy cannot be ascribed to the hypsometrical determination of its principal peaks as to the trigonometrical operations in the *Himálaya*. The highest peak in the *Andes* is the *Aconcagua* (23,004 ft.) in *Chili* (*Pissis* gives only 22,451 ft.): and there are as many as five peaks higher than the *Chimbarozo* (21,422 ft.). In *High Asia*, forty-five peaks are known, which exceed in height the dominating peak of the *Andes*, the *Aconcagua*.

In the *Alps*, *Mont Blanc* (15,784 ft.) and *Monte Rosa* (15,223 ft.) are well known to be the highest peaks. Other high peaks are; *Täschhorn*, or *Lagerhorn* (14,954 ft.), *Weisshorn* (14,813 ft.), *Mont Cervin* (14,787 ft.), and *Dent Blanche* (14,305 ft.).

II. HYDROGRAPHY.

1. Lakes.

In the *Himálaya*, there are but very few lakes. That of *Nainital* (6,520 ft.), in *Kámáon*, the *Vúllar* lake (5,126 ft.), and the *Chinär* lake near *Srināgar* in *Kashmír*, suffice to exhaust the category of those deserving mention.

Glacier lakes.—Accumulations of water formed by one glacier obstructing the outlet of a higher one—are of much more frequent occurrence. At times, the wall of ice breaks away before the pressure of the swollen waters, when the lower lands become suddenly inundated, and the torrent rushes on with uninterrupted violence for miles, exercising a marked influence even down to the lower parts of the river. Similar inundations, some of them of a most destructive character, have several times occurred. Two of the most elevated glacier-lakes are the Destál (17,745 ft.), in Gārhhvál, and the Námtso, or Yúnám (15,570 ft.) in Lahöl.

Western Tibet and Turkistán possess many lakes, all of which are situated in great heights; they are, however, gradually drying up, as becomes apparent by the unmistakeable marks of larger surfaces remaining from former times. They contain a greater quantity of salt than lakes in general, and most of them to an amount which renders them more or less brackish.

The following are the names and the heights of the principal:—

Lakes of Western Tibet and Turkistán.

Aksáe Chin,	16,620	Níma Kar,	15,100
Tso Gyagár,	15,693	Háule,	14,600
Tso Kar, or Khanri Taláu,*	15,684	Tso Gam,	14,580
Múre Tso,	15,517	Tso Bul,	14,400
Kiúk-Kíöl,	15,460	Tso Mitbál,	14,167
Mansaráur, or Tso Mápan,	15,250	Upper Tsomognalarí,	14,050
Rákus Tal, or Tso Lánag,	15,250	Lower Tsomognalarí,...	14,010
Tsomoríri,	*15,130		

In the *Andes*, the most remarkable lake is that of Titicaca (12,843 ft.)

The foot of the *Alps* is adorned with a great many lakes, all in low elevations of from 600 to 1,600 ft.

2. Springs.

Springs of an ordinary, mean temperature, commonly called cold springs, are of frequent occurrence in High Asia; the finest and most copious springs are to be found in *Kashmír*, as the spring Vérnag, Vétur Vúllar, Kókar Nag, Achibál, A'nat Nag and others. The spring Sóna Bréri, also in *Kashmír*, situate about five miles south-east of Shahabád, is the only intermittent spring as yet known in High Asia.

* According to Mr. Theobald, Jr. (see Journ. As. Soc., Beng., 1862, No. V., p. 513) only 14,272.

In *Western Tibet*, where rains in the higher parts are rare, and where the dryness in summer is so excessive that even the formation of dew is scarcely perceptible, cold springs are comparatively rare. In *Turkistán*, in *Bákti*, and *Hasóra*, we find a greater number of springs, a fact intimately connected with the general meteorological conditions of these provinces.

With reference to the limit, at which springs are to be found still in High Asia, I give the following data, derived from our own observations. The greatest height, at which we found a spring in the *Himálaya*, was 15,920 ft.; this spring was situated on the slopes of the *Kyúngar* pass. In *Tibet*, we discovered a real spring on the slopes of the *Ibi Gámin* peak still at a height of 17,650 ft.; this spring is probably the highest spring hitherto found.

As the highest spring in the *Andes*, *Humboldt* names the one called "*Ladera de Cadlud*," at a height of 15,526 ft. above the level of the sea; in the *Alps*, *Adolphe* and *Hermann* have found the highest cold spring at 10,440 ft.

Hot springs occur in High Asia in a surprisingly great number,* from the sea-level up to heights of more than 16,000 ft. The highest hot springs of High Asia are at *Murgái*, (16,382 ft.), in *Núbia*, at *Momái* (about 16,000 ft.), in *Sikkim*, at *Púga* (15,264 ft.), in *Ladáki*, near the lake *Aiúkkió* (15,010 ft.), in *Turkistán*, and at *Chagrár* (about 15,000 ft.), in *Pangkóng*. As a curious and remarkable fact I may add, that the highest hot spring in *India*, at *Hazaribágh*, in *Bengal*, is only 1,750 ft. above the level of the sea.

The hottest spring of High Asia is at *Manikárn* (temp. 202° *Faht.*) in *Kúlu* (this is the hottest spring as yet found all over Asia), at *Jámnótri* (temp. 193° *Faht.*) in *Gárhvál*, and at *Chorkóna* (temp. 190° *Faht.*) in *Bákti*. The hottest springs of the world (if we exclude those, which rise in the immediate neighbourhood of volcanoes) are to be found in the *Andes*. There "*Aguas de Comangillas*," near *Chichemequillo* and *Quanaxuato*, at a height of about 6,200 ft., in latitude north 21°, show a temperature of 205°.3 *Faht.*;† and the springs "*Las Trincheras*" between *Porto Cabello* and *Valencias*, in

* See the "Enumeration of the hot springs of India and High Asia, given by me in *As. Soc. Journal*, 1864, No. I., p. 49.

† *Humboldt's "Essai pratique sur la Nouvelle Espagne."* 2nd Ed., Vol. III. (1827), p. 190.



Mexico, have increased, between the years 1806 and 1823, from 195° Faht. to $206^{\circ}.6$ Faht.,* thus exceeding at present the temperature of the "Aguas de Comangillas" by $1^{\circ}.3$ Faht.

The hottest known spring of Europe, unconnected with present volcanoes, is that of Chaudes Aigues in Auvergne (temp. 176° Faht.).†

III. PHYSICAL PHENOMENA.

1. Snow-fall.

The lowest height at which snow has fallen in the *Himálaya* during the winter, is about 2,500 ft., but such cases are extremely rare, having occurred in Kāmdon and Gārhwāl only twice (in 1817 and 1847), since the British took possession of the country.‡ Snow has fallen in the memory of man only once in Nahān§ (3,207 ft.), in the province of Simla. The snow, which falls once within several years in the Kāngra valley, down to heights of 3,000 and 2,700 ft., disappears almost immediately. At Haribāgh the snow melts away on the day it falls, or at least within thirty-six hours. During my travels in Kūlu, I was informed by the natives, as well as by several gentlemen who knew this part of the country thoroughly, that the village of Māndi (2,480 ft.), is below the limit of snow-fall.

At an elevation of 5,000 ft. scarcely one year passes by without snow-fall; but, even at this height, the snow disappears after a few days, and sometimes even hours. "It snows, but one does not see it," the natives of Kathmāndu (4,354 ft.) very significantly use to say, meaning, that the rare nightly snow-falls are melted away by the earliest rays of the sun. 6,000 ft. may be assigned as the limit in the *Himálaya*, where snow regularly falls in winter, with the probability of remaining some time upon the ground.

In *Western Tibet* and in the *Karakorúm*, the general elevation of the country is so great, even in its lowest regions, that no part lies below the limit of hibernal snow-fall. But the quantity of snow actually falling is inconsiderable, and this circumstance it is, which forms one of the chief causes that the passes of the *Karakorúm*, even

* Humboldt's "Kosmos," Vol. IV., p. 246.

† Newbold, in "Philos. Transactions," 1845, p. 127.

‡ Colonel R. Strachey, in this Journal, Vol. XVIII., Part I., p. 309.

§ This Journal, Vol. III., p. 367.



the highest, remain open throughout the year. In some parts of Tibet the winter is the only season, when atmospheric precipitation at all takes place.

In the *Künlün*, even on its southern slopes, a greater amount of snow is precipitated than on the northern side of the *Karakorúm*, whilst its Turkistani (northern) slopes differ still more from the *Karakorúm* in this respect, they being visited by very heavy rains and great snow-falls. Even at *Káshgar* (about 3,500 ft), in *Turkistán*, there are said to be several snowy days every winter.

The data, which I was able to collect on snow-fall in the *Andes*, are so few and vague, that I could not draw any conclusion from them. Also for the *Alps*, I could not bring forward any new facts with reference to the snow-fall.

2. *Snow-line.*

The snow-line, or the average height where snow remains perpetually throughout the year, has offered unexpected difficulties in its determination for the *Himálaya*. When Webb and Moorcroft first pointed out the general heights reached by the snow-line, when they first discovered the remarkable fact, that, in spite of the influence arising from exposition, the snow-line of the *Himálaya* descends lower on its southern (Indian) than on its northern (Tibetan) slopes, the statements of these travellers, now proved to be correct in all material points, were discredited by men of science both in Europe and in India. Humboldt, however, was among the first who endeavoured to remove the distrust with which these discoveries were received; he also gave an explanation* of the causes which were possibly sufficient to originate so remarkable a phenomenon as this of the unlooked-for differences existing between the snow-lines of the Tibetan and Indian slopes. He considers it "the results conjointly of the radiation of heat from the neighbouring elevated plains, the serenity of the sky, and the infrequent formation of snow in very cold and dry air." Of all these causes, however, the last is the most important. The direct insolation, being less interrupted on the Tibetan side, has also its share of influence; but the effect is comparatively small. As the best corroboration of the quantity of snow-fall being the principal cause of the depression on the southern (Indian) slope of the *Himálaya*, may

* "*Asie Centrale*," pp. 284, 327; "*Kosmos*;" Vol. I. p. 358.

be adduced the fact, that we found the isothermal lines for the year and the summer, which coincided with the snow-line on the Indian side, decidedly warmer than those on a level with the Tibetan snow-line. The fact, moreover, of the *Karakorúm*—though on an average three degrees farther north—having the snow-line so excessively high on both its slopes, offers another instance of the influence of limited precipitation.

In the *Künlün*, the meteorological conditions also become apparent in the different limits of the snow-line on either side; but here the effect is the reverse of that perceived in the *Himálaya*, the greater precipitation on the “northern” slopes (towards the plains of *Turkistán*) lowering the snow-line on that side to a considerable extent.

Although, in the *Himálaya* at large, the snow-limit of the Tibetan side does not descend so low as that of the Indian, yet the influence of exposition at once becomes apparent in the ordinary sense, corresponding to these latitudes, if we examine the slopes of a crest or mountain, of which, by the nature of its position, both slopes belong either to the Indian side of the ridge in general, or to the Tibetan side. The many and vehement disputes upon the much-discussed subject of snow-limits have chiefly arisen from the entire neglect of this modification.*

The values we obtain for the height of the snow-line on the three mountain chains of *High Asia* are :

			Feet.
A. <i>Himálaya</i> .	Southern (Indian slopes), ...	...	16,200
	Northern (Tibetan) slopes, ...	...	17,400
B. <i>Karakorúm</i> .	Southern (Tibetan) slopes, ...	...	19,400
	Northern (along the <i>Turkistani</i> plateaux),		18,600
C. <i>Künlün</i> .	Southern (facing mountainous ramifications),		15,800
	Northern (facing the <i>Turkistáni</i> plain),† ...		15,100

For the *Andes*, the snow-limits are, according to Humboldt and Pentland :

* See Batten, in the “*Calcutta Jour. of Nat. Hist.*,” Vol. IV. p. 537; Vol. V. p. 383. Capt. T. Hutton, “in the same Journ.” Vol. IV. p. 275; Vol. V. p. 379; Vol. VI. p. 56; and Capt. A. Jack, “in the same Journ.” Vol. IV. p. 455.

† “*Asie Centrale*,” 1847, Vol. II. pp. 165 and 177.



	Feet.
Eastern Andes of Bolivia,	15,900
Western Andes of Bolivia,	18,500
Andes of Quito,	15,700
For the <i>Alps</i> , my brothers obtained :	
Southern slopes,	9,200
Northern slopes,	8,900
Extremes (near the Mont Blanc and Monte Rosa group),	9,800

3. *Glaciers.*

The existence of the glaciers of High Asia was first made known for *Western Tibet*, by Vigne, who alludes to them repeatedly in his "*Travels in Kashmír*," London, 1842. Colonel Richard Strachey was the first* who (in 1847) proved their existence in the *Himálaya*. The recent date of this discovery will appear the more surprising, when the immense number of glaciers now positively ascertained to be in this region is taken into consideration. The great amount of ice to be met with, even in lower elevations of the *Himálaya*, could not of course escape the observation of previous travellers; these masses, however, they used to designate as "hard, frozen snow-beds," and to consider them as local phenomena, analogous to remains of avalanches.

On both sides of the *Karakorúm* and the *Künlün*, we also found glaciers, having forms identical with those of the *Alps*, and following the same laws of motion. Some of them are considerably larger than the glaciers in Europe. The *Aletsch* glacier in the *Alps* extends a little over fifteen miles in length, whilst some of the glaciers, surveyed by Captain Montgomerie and his party in *Bálti* (on the southern side of the *Karakorúm*)" boast of no less than thirty-six miles in length, with a breadth of from one to two and a half miles. The *Biáfo* glacier forms, with the glacier on the opposite slope towards *Miggáir*, a continuous river of ice of sixty-four miles running in an almost straight line, and without any break in its continuity beyond those of the ordinary crevasses of glaciers. The *Biáfo* glacier is supplied in a great measure from a vast dome of ice and snow, about one hundred and eighty square miles in area, in the whole of which only a few projecting points of wall are visible. The *Bálsoro* main glacier, thirty-

* See this Journal, Vol. XVI., part II. p. 794; Vol. XVII. part II. p. 203.

six miles in length, and with fourteen large tributary glaciers of from three to ten miles in length, would form a study in itself, and give employment for several summers, before it could be properly examined."*

In the *Himálaya*, the lowest glaciers go down to 11,000 ft. and even 10,500 ft.; the Píndari ending at 11,492 ft., the Timtimna at 11,430 ft., the Tsóji at 10,967 ft., and the Chàia at 10,520 ft.

In *Western Tibet*, they descend to about the same elevation; thus, the Mustágh 11,576 ft., the Tapto 11,508 ft., the Támi Chúet to 10,460 ft., the Bépho (Biáfo of Capt. Montgomerie?), near Askoli, even to 9,876 ft. The latter is worthy of notice as a remarkable case of low termination.

In the *Künlün*, the glaciers end probably at heights not much differing from those in Western Tibet; at least so we infer from the general appearance of the upper part of the glaciers we saw during our travels in these regions. The glaciers on both flanks of the Elchi pass presented, however, no instances of particularly deep descent.

In the *Andes*, no glaciers are as yet known to exist,† and they do not occur in tropical America, from the equator to 19° latitude north.

In the *Alps*, the lowest glacier is that of Lower Grindelwald, ending at 3,290 ft., but in general 5,000 ft. must be considered as a rather low end of a glacier.

IV. THE VARIETIES OF HABITATION.

1. *Towns and Villages.*

The *Himálaya* rises, in general, so abruptly above the plains of India, and the latter, particularly in the western regions, are in themselves of such an elevation, that even in the lower parts of the valleys there are but few, if any points of less height than 1,000 ft. above the level of the sea. Two causes more especially have tended to displace the order of population in these districts, the lower parts being almost deserted in favour of the lands lying immediately above. In the first instance, the prevailing steepness of the country hereabouts, which is still considerably increased by the erosion of the rivers, precludes the successful cultivation of the soil; and, again, the fertile, well cultiva-

* Montgomerie, in "Journ. As. Soc. Beng. 1862, No. II. p. 210.

† Humboldt, "Asie Centrale," Vol. II. p. 167.

ted plains of India are converted, wherever they touch the southern foot of the Himálaya, into swampy and marshy lands, called the Tarái, which in some parts form but a narrow strip or belt, whilst in others, as in Nepál, they attain a breadth of thirty to forty miles. The Tarái abounds with large and lofty forest trees. Owing to the swampy and malarious character of the Tarái, which skirts the extremities of the valleys, the neighbourhood is rendered as uninhabitable to the tribes of the Central Himálaya as to the highly susceptible and less seasoned visitor from European climes. Consequently (from all these reasons stated), in the inferior stratum of heights, ranging between 2,000 and 3,000 ft., the number of places inhabited by the natives is comparatively insignificant; while population reaches its maximum in the rich belt of life rising from 5,000 to 8,000 ft., the traces of man and his dwelling-place begin rapidly to disappear at 11,000 ft., and even before.

The *highest limits of habitation*, however, very often present themselves under a form which almost excludes the possibility of strictly comparing them as dependent upon climate. It is a remarkable fact, that in some provinces of the Himálaya, especially in Nepál, Kāmáon, and Gārhvāl, many villages are deserted in winter, though as far as regards their elevation and the solid construction of the houses, they might very well be inhabited throughout the year. The natives, however, prefer removing to villages less elevated, where they spend the colder months. In the Himálaya west of Gārhvāl, such modifications do not occur; at least we are not aware of the existence of villages in Simla, Kúlū, Kishtvār &c., where the inhabitants follow regularly the nomadic example furnished in other parts of the hill country.

The Alps of Europe also present instances of this kind in Findelen (7,192 ft.), Bresily (6,594 ft.), and many other summer villages of greater or less elevation on the French side of the Alps.

Western Tibet is a country of such general elevation, that only in the province of Bálti villages are to be found below a height of 6,000 ft. Some of the chief towns are built at considerable elevations; Leh, the capital of Ladák, lies 11,527 ft. above the level of the sea. The *highest permanently inhabited* places are, however, Buddhist monasteries, the most elevated being probably that of Hánle, (15,117 ft.), in Ladák. I state it positively as my conviction, that nowhere in



the world there exists a permanently inhabited place at a height exceeding 15,600 ft. Paul de Carmoy's "Pueblo de Ocoruro," in the Sierra Nevada, 18,454 ft. high, will prove, on a closer examination, to be a temporarily inhabited place, similar to the *summer villages* of Tibet, of which I name Gártok (15,090 ft.), Nórbu (15,946 ft.), and Púga (15,264 ft.)

In the *Künlün*, even the foot of its southern (Tibetan) slopes is so elevated, that no villages exist at all. By combining with our own observations a variety of reports received, I obtain for its northern slopes 9,400 ft. as the limit of permanently inhabited villages; summer villages reach about 10,200 ft.

In the *Andes*, large and important permanently inhabited places have been built at great heights (Cerro de Pasco, 14,098 ft., Potosi 13,665 ft.); they are generally situated on plateaux. Santa Barbara, a mine with solid houses, about three miles south of Huancavelica, is situated at a height of 14,508 ft.

For the *Alps*, I have already had occasion to mention their summer villages. The highest permanently inhabited villages are in the valley of Avers in Graubündten, where Juf lies at an elevation of 7,172 ft., and that of Cresta exceeds 6,700 ft. But the roads leading across the passes have rendered it necessary to construct houses near the top which are permanently inhabited; the highest of these at present being the well known monastery of St. Bernard (8,114 ft.) As long as the road over the Stelvio or Stilfser Joch was kept up, Santa Maria (8,146 ft.) was also inhabited throughout the year.

2. Pasture-grounds.

In the *Himálaya*, pasture-grounds "Kárik," for sheep and bovine cattle, are for the most part in low elevations, and at no great distance from the villages. The Kárik Biterguár, in Kāmáon, must be mentioned as an exception to this general rule, it being situated at an elevation of 14,594 ft. Nowhere are there built on these pasture-grounds *châlets* (Alpenhütten), which are as little used in the Himálaya as tents in the Alps.

Dairies, which are dispersed all over the Alps, and which form the source of a profitable income under an able management, are quite unknown in the Himálaya, even in those parts, as Kashmir and Nepál,

where ample tracts exist extremely favourable for erecting such establishments even on a large scale.

The pasture-grounds of *Tibet*, to which the numerous herds of sheep are driven in summer, reach an elevation from 15,000 to 16,349 ft., beyond which the Tibetan shepherds, who sometimes remain upon the mountains from June to September, cannot be supposed to make any permanent residence. The most elevated pasture-grounds of Tibet are, Lársa (16,349 ft.), Zinchín (16,222 ft.), Kyángchu (15,781 ft.), Rúkchin (15,064 ft.), Amlung (15,300 ft.), and Júgta (15,058 ft.)

Though many cloudless days succeed each other in these lofty regions, thus leaving the power of direct insolation unimpaired, the climate always remains bleak; while the prevailing winds not only aggravate the effects of a low temperature, but also that of a low barometrical pressure, thus presenting a remarkable modification of climate, of which I shall hereafter give some detail in the considerations upon the influence of height in general. The shepherds with difficulty provide themselves with a sufficient supply of fuel for cooking purposes; sometimes they contrive with much labour and pains to erect rude stone walls, behind which they may take shelter during the night. These walls are usually circular in form, from four to five feet high, and without a roof.

In the *Künlün*, the slopes on its southern side are so elevated, that there exist no pasture-grounds at all; on its northern slopes, they do not occur above 13,000 ft.

For the *Andes* no data with reference to pasture-grounds are at my disposal.

The pasture-grounds in the *Alps*, which are generally in the neighbourhood of Châlets, may be met with at heights of 8,000 ft. and upwards: the Fluhhalpe (8,468 ft.) on the Findelen glacier near the Monte Rosa, and the Torrenthütte, in the Anniviers valley, being instances of the greatest elevations.

V. EXTREME HEIGHTS VISITED BY MAN.

1. *Mountain-ascents.*

Temporary habitations, frequented for some months, as we have seen from the discussion of the highest pasture-grounds, sometimes reach a height of nearly 16,300 ft. As far as my experience goes, I

may state, that for short periods of ten or twelve days, man may considerably exceed this height, not without suffering, but at least without positive injury to himself. During our explorations of the Ibi Gámin glaciers, August 13th to 23rd, 1855, we encamped and slept during these ten days in company with eight men at very unusual heights. During this period, our lowest camp was pitched at 19,326 ft.—the greatest height at which we ever passed a night: — another was at 19,094 ft.; two camps exceeded 18,300 ft., and the remainder ranged between 18,000 and 17,000 ft. Apart from the extreme elevation and consequent cold; the bodily exertions imposed upon us during our stay, proved a great tax upon our powers. Once we crossed a pass of 20,439 ft., and three days earlier, August 19th, 1855, we had ascended the flanks of Ibi Gámin to a height of 22,239 ft. This, as far as we know, is the greatest height yet reached on any mountain, though considerably below that to which man has arisen in balloons.

On the Sáassar peak we attained (August 3rd, 1856) an elevation of 20,120 ft. As early as 1818, however, the brothers Alexander and James G. Gerard ascended (October 18th) a peak in Spiti 19,411 ft. high, not far from the Porgyál, or Tazhigáng. Subsequently, August 31st, 1828, Dr. James G. Gerard reached 20,400 ft.

From Captain T. G. Montgomerie we learn, that a station of 19,979 ft. has been reached twice by Mr. W. H. Johnson, and another of 19,958 ft.* in height by Mr. W. G. Beverley. Mr. Johnson took, besides, observations in Ladák at one station more than 20,600 ft. high, the greatest altitude yet attained as a station of the Trigonometrical Survey of India.† A trigonometrical mark has even been erected on a point 21,480 ft. above the level of the sea, "but unfortunately there was not sufficient space to put a theodolite on it."

In the *Andes*, Humboldt ascended the flanks of Chimborazo (June 23rd, 1802) to a height of 19,286 ft.; this being the extreme elevation attained at that period. Some years afterwards (December 16th, 1831), Boussingault reached, on the same peak, a height of 19,695 ft.‡

In the *Alps*, my brothers Adolphe and Hermann once remained in the Vincenthütte, on the slopes of Monte Rosa, fourteen days at a

* See this Journal, 1861, No. II., pp. 99, 110.

† See this Journal, 1863, No. II., p. iii.

‡ Humboldt's "Kleinere Schriften," p. 157.



height of 10,374 ft. The well known English Professors Tyndall and Frankland even passed the night of August 21st, 1859, on the top of the Mont Blanc (15,784 ft.)

2. *Balloon-ascents.*

In the free atmosphere the greatest height was reached by Mr. Glaisher in a balloon, which was directed by Mr. Coswell; he ascended, September 5th, 1862, the extraordinary height of at least 30,000 ft., but, as he was unable to make any observations above that height, being suddenly overtaken by sickness, it is supposed that the balloon rose as high as seven miles = 36,960 ft.

Not less remarkable than this ascent was the one performed by Gay-Lussac, as early as the beginning of this century (September 16th, 1804), when he rose to 23,020 ft. Between Gay-Lussac's and Mr. Glaisher's ascent, several attempts have been made to reach great heights in balloons, especially in England, during one of which the late Mr. Welsh reached (November 10th, 1852) 22,930 ft.* The balloon-ascents made in England were all combined with experiments of a highly interesting nature, and instituted by a scientific committee, among whose members it is sufficient only to name Sabine and Sykes.

Previous to Mr. Welsh, Messrs. Bixio and Barral rose (July 27th, 1850) to a height of 23,009 ft.

As a balloon-ascent, remarkable not only on account of the height reached, but on account of the horizontal distance performed, I must mention the one made by Mr. Nadar, in company with eight persons, October 18th, 1863. Mr. Nadar rose from Paris and let himself down—or he rather fell down—near Rethem, a small town on the river Aller, in Hanover. The direct distance between these two towns is about 395 miles, and as it took 15 hours, 47 minutes to travel through this distance, the balloon flew 2,227 ft. per minute, or 37 ft. per second. But, as the balloon was far from going in a straight line, it has been computed, that the greatest velocity attained by it amounted to 50 ft. per second.

3. *Effect of height.*

The effect of height is chiefly perceptible in the decrease of temperature and barometrical pressure. According to our observations,

* "Philosophical Transactions," 1853, Part III., p. 320.

the atmospheric pressure is, at a height of about 18,600 or 18,800 ft., one-half of that at the level of the sea. At an elevation of 22,200 ft. (so trivial a height when compared with the extreme upper limit of the atmosphere), we observed a barometrical pressure of 13.364 inches, so that nearly three-fifths of the weight of the atmosphere lay below the point reached by us at the time.

It is evident that there must be a limit beyond which the degree of rarefaction is incompatible with the conditions of human existence; but it will ever remain extremely difficult to determine the line of demarcation, with any approach to scientific precision.

The influence* which height exercises upon man, varies with the individual; a man in good health having the chance of less suffering. The difference of race has apparently no appreciable importance. Our Hindu servants suffered far more from the cold than our Tibetan companions, though not more from the diminished pressure. For the generality of people the influence of height begins at 16,500 ft., a height nearly coinciding with that of the highest pasture grounds visited by shepherds.

The complaints produced by diminished pressure are,—headache, difficulty of respiration, and affection of the lungs, the latter even proceeding so far as to occasion blood-spitting, want of appetite and even sickness, muscular weakness, and a general depression and lowness of spirits. Bleeding of the nose we experienced ourselves, though very rarely, the loss of blood on such occasions being insignificant; but bleeding of the ears and lips we neither experienced personally, nor observed in others during our travels in *High Asia*. Humboldt,† however, states, that on the Antisana, at a height of 18,141 ft., his companion, Don Carlos Montufar, bled heavily from the lips, and that during the ascent of the Chimborazo, every one suffered from bleeding of the lips and even the gums.

The effects here mentioned, which disappear in a healthy man almost simultaneously with his return to lower regions, are not sensibly increased by cold, but the wind has a most decided influence for

* Notices and remarks on this subject are to be found in "Gleanings in Science," Vol. I., p. 330; Gerard's "Koonawur;" Hooker's "Himalayan Journals," Vol. II., p. 413; Thomson's "Western Himalaya and Tibet," p. 135 and p. 433.

† "Kleinere Schriften," Vol. I., p. 148.

the worse upon the feelings. As this was a phenomenon we had not hitherto found mentioned by former observers, we directed our particular attention to it, and remarked instances where fatigue had absolutely nothing to do with it. In the plateaux of the Karakorúm, it was a common occurrence, even for the sleepers in the tents, where they might be considered as somewhat protected, to be waked up in the night with a heavy feeling of oppression, the entire disturbance being traceable to a breeze, which had sprung up during the hours of rest.

The effects of diminished atmospheric pressure are considerably aggravated by fatigue. It is surprising to what a degree it is possible for exhaustion to supervene; even the act of speaking is felt to be a labour, and one gets as careless of comfort as of danger.

VI. LIMITS OF VEGETATION AND ANIMAL LIFE.

1. *Vegetation.*

In *India*, the vegetation is not limited by climate in the elevations existing; the highest peaks, as the Dodabétta (8,640 ft.), in the Nilgiris, the most elevated plateaux are covered with trees, shrubs, and in fact a luxurious vegetation, not only along their slopes, but even on their top.

In the *Himálaya*, trees grow very generally up to heights of 11,800 ft., and in most parts there are extensive forests covering the sides of the mountains at but a little distance below this limit. Those forests are especially beautiful in the higher valleys of Kâmaón and Gârhvâl, in the Bhagiráthi valley.

In *Western Tibet*, though we did traverse it in various directions, none of us found anything at all corresponding to a forest. Apricot trees, willows, and poplars are frequently cultivated on a large scale; poplars, indeed, are found at Mánguang, in Gnári Khórsum, still at a height of 13,457 ft.; but they are the objects of the greatest care and attention to the Lamas.

In the *Künlün*, we found the trees on its northern side not to grow above 9,100 ft. On the northern side, we saw no trees at all; here the considerable height of the valleys we passed excluded them.

In the *Andes*, trees end at about 12,130 ft.; in the *Alps* on an average at 6,400 ft., isolated specimens occurring, however, above 7,000 ft.

The cultivation of grain coincides, in most cases, with the highest permanently inhabited villages : but the extremes of cultivated grain remain below the limit of permanent habitation. In the *Himálaya*, cultivation of grain does not exceed 11,800 ft., in *Tibet* 14,700 ft., and in the *Künlün* 9,700 ft. For the *Andes*, the limit is 11,800 ft. ; in the *Alps*, some of the extremes are found near Tindelen, at a height of 6,630 ft., but the mean is about 5,000 ft.

The upper mean limit of grass-vegetation is, in the *Himálaya*, at 15,400 ft., in *Western Tibet* at 16,500 ft. ; in the *Künlün*, grass is not found above 14,800 ft.

Shrubs grow, in the *Himálaya*, up to 15,200 ft., in *Western Tibet*, as high as 17,000 ft. On the plateaux to the north of the *Karakorúm*, shrubs are found at 16,900 ft., and, which is more remarkable, they occasionally grow there in considerable quantities on spots entirely destitute of grass. As an example, I mention the Voháb Chilgâne plateau (16,419 ft.) and Bashmalgún (14,207 ft.)

In the *Künlün*, the upper limit of shrubs does not exceed 12,700 ft. ; above this height grass is still plentiful ; and shrubs being here, as generally everywhere else, confined to a limit below the vegetation of grass, the range presents an essential contrast in this respect to the characteristic aspect of the *Karakorúm*.

In the *Andes*, shrubs grow up to 13,420 ft., in the *Alps*, their upper limit is at 8,000 ft.

The very extreme limit of phanerogamic plants appeared in *Tibet* at the north-eastern slopes of the Ibi Gámin pass, at a height of 19,809 ft. ; next in order came those of the Gunshankār peak, in Gnári Khórsum, at 19,237 ft. In the *Himálaya*, the highest plants were found by us at 17,500 ft., on the slopes of the Jánte pass, in Kámáon.

In the *Andes*, Colonel Hall found the highest phanerogamic plants on the slopes of Chimborazo, at 15,769 ft., consequently 4,040 ft. lower than the Ibi Gámin plants in Tibet.

In the *Alps*, my brothers found an analogous extreme on the southern slopes of the Vincent pyramide at 12,540 ft.

2. Animal life.

Monkeys appear to frequent, in the *Himálaya*, regions exceeding 11,000 ft. in height ; the *Semnopithecus schistaceus*, Hodgs. ascending

higher than others. These monkeys, called "Langúrs" by the natives, have been frequently seen at 11,000 ft., while the fir-trees among which they sported were loaded with snow-wreaths. This species is not known in India, whilst the *Macacus Rhesus* is met with in India, as well as in the Himálaya.

In *Western Tibet*, and farther to the north, no monkeys have yet been found. *Tigers* ascend to 11,000 ft. in the Himálaya; they are not, however, seen in *Western Tibet* or the Kūnlūn.

Leopards may be met with, in the Himálaya and in Tibet, even at 13,000 and 14,000 ft. The *lion*, though intimately connected with the mythology of High Asia, has been forthcoming, in historical times, only in Kashmír. In India, the lion occurs at the present day only in Guzrāt, and there only in very small numbers.

Jackals were found by us in the Karakorúm between 16,000 and 17,000 ft. *Wolves* are not known to frequent the Himálaya Proper, but they are found in Tibet, where we saw of traces of them in sand close to the Karakorúm pass (18,345 ft.)

Various species of beautiful *wild sheep* and *ibex*, together with the *Kyáng* and the *wild yak*, are met with in large herds on the highest plateaux between the Karakorúm and the Kūnlūn.

The *cat* is common in Tibet; *dogs* are the companions of the Tibetan shepherds, whom they follow over passes exceeding 18,000 ft.

Some species of *bats* are seen in the Himálaya up to 9,000 ft.; and the Tibetan *hare* occurs even in heights exceeding 18,000 ft.

Migratory birds are not known to cross the Himálaya, as many birds of Europe cross the Alps. *Doves* were seen by us at very great heights in the Karakorúm and Kūnlūn; this was the most surprising, as other birds were very rare.

The domestic *fowl* has recently been introduced with great success by Guláb Singh into Bálti, Ladák, and Núbra.

Fishes were found by us in some rivulets of Tibet exceeding 15,000 ft. In the Alps they cannot live beyond 7,000 ft.

Of *reptiles* we found snakes and saurians as high as 15,200 ft. In the Alps they go up to 6,000 ft., in the *Pyrenees* to 7,000 ft. In the *Andes*, snakes were found by Schimarda at about 11,500 ft.

For *butterflies* we found in the Himálaya 13,000 ft., in Tibet and Turkistán even 16,000 ft. as localities of permanent habitation. *Bee-*

ties probably follow the highest formation of grassy turf in the Himá-laya, as well as in the Andes and the Alps. *Mosquitoes* go up to 8,500 ft. ; and *peepsies* make themselves very troublesome during the rainy season as high as 13,000 ft.

The existence of *infusoria* seems as little subject to limitation by height in High Asia, as in the Andes and Alps. In a few fragments which we chipped off from the rocks of the Ibi Gamin pass (20,459 ft.) Prof. Ehrenberg of Berlin detected their presence, and found them not insignificant in quantity ; he discovered twelve species new to science.

(Notes and Queries.)

[Received 20th December, 1865.]

Camp, near Myanounng, November 22nd, 1865.

During a visit to Calcutta a few months ago, Mr. Grote drew my attention to a sort of controversy which had been started at home, touching the habit, which fireflies were stated to exhibit occasionally, of a concurrent exhibition of their light, by vast multitudes acting in unison; a statement which appeared to have been somewhat sceptically received. Mr. Grote does not appear to have ever witnessed this phenomenon in Bengal, and questioned me if I had ever observed any confirmatory instance. Fireflies are tolerably well known, of course, to the resident in Bengal, but I had never there observed any such habit among the countless fireflies, which form such fiery-like ornaments to the shrubberies about Calcutta. In Pegu, however, I have witnessed the exhibition in question; myriads of fireflies emitting their light, and again relapsing into darkness, in the most perfect rhythmic unison. I much regret, that I did not secure specimens, but the circumstances were as follows. I had halted my boat for the night, alongside a small clearing in the low lying tract of country, forming part of the Irawadi estuary (Delta), east of the Bassein river, where the water was salt, and the entire country not more than a foot, if so much, above the flood level. Night had closed in, and my servant, who brought in the tea, asked me to step out of my tent and see the fireflies which, he said, he had never seen the like of before. On stepping out of the tent, a truly beautiful sight presented itself. In front was the broad and deep river sweeping on, *νυκτε εοικώς*, with its indistinctly seen background of primæval forest on its opposite bank. Around me was the recently-formed clearing, with its two or three huts and my own camp, as the sole proof of man's occupancy, for miles and miles, but, for all the wildness and almost desolation of the scene, the bank on which I stood was a glorious spectacle, and those acquainted with the class of native servants will well understand that it must have been at once unusual and beautiful indeed to rivet the attention of a listless khitmutgar!

The bushes overhanging the water were one mass of fireflies, though, from the confined space available for them on low shrubs, the

numbers may not have been actually more than are often congregated in Bengal. The light of this great body of insects was given out as I have said, in rhythmic flashes, and, for a second or two, lighted up the bushes in a beautiful manner; heightened, no doubt, by the sudden relapse into darkness which followed each flash. These are the facts of the case (and I may add, it was towards the end of the year), and the only suggestion I would throw out, to account for the unusual method of luminous emanation, is, that the close congregation of large numbers of insects, from the small space afforded them by the bushes in question, may have given rise to the synchronous emission of the flash, by the force of imitation or *sympathy*.

Mr. Montgomery, of the Survey Department here, also fully corroborates the habit of our Pegu fireflies simultaneously emitting their light, but adds, he has only remarked it under conditions similar to those described above, in low swampy ground. It still remains, therefore, to be decided if the insect is different from the ordinary one, or if, as I am inclined to think, the simultaneity is produced by sympathy and great crowding of individuals.

While my pen is in my hand, I would add a few words on the address of Dr. J. E. Gray to the Zoological Section of the British Association, printed at page 75 of the Notices and Abstracts appended to the Report of the Association for 1864.

The excellent remarks on the aim and arrangement of Public Museums will, it is to be hoped, not escape the attention of those interested in our own Calcutta Museum, and the especial stress he lays on the exclusion of light from collections on spirits, is what I urgently brought to the notice of the Society but a short time since. It is not, however, to this portion of Dr. Gray's address that I would now refer, but to the statement at page 82 that, "*the natives of India and of the islands of the Malayan Archipelago have brought into a semi-domesticated state various species of wild cattle, such as the Gyal, the Gour, and the Banteng.*"

Of the first of these, the Gyal, we know that such is the case, but I should much like to know in what part of India or Malaynesia the Gour or the Banteng are "semi-domesticated," certainly, the feat has never been performed by any "*native of India,*" of whose geography and powers incurably lax notions appear to be stereotyped in England,

from the ablest downwards. I would enquire, therefore, through the pages of this Journal, to what instances Dr. Gray can allude, as the fact is certainly novel to those in India. The Governor of Rangoon, at the time of the last war, I am told, had a pair of Gour sufficiently tame to be yoked in a cart, but this is quite insufficient to establish their claim to be viewed as semi-domesticated. In India, the difficulty of rearing the calves is notorious.

Again, immediately before the passage I have quoted above, Dr. Gray remarks, "In the lower and warmer region of Central and Southern Asia, the Zebra has been completely domesticated."

In the passage, Dr. Gray is alluding to wild species brought by man into a state of domestication, and I confess to some curiosity as to the wild stock of the domesticated Zebra. There is, I fancy, some little confusion, however, in Dr. Gray's ideas here, as, on the previous page, he tells us, "the oxen" "are never found *truly wild*."

The distinction, too, which Dr. Gray draws (*loc. cit.*) between the "*truly domesticated*" animals, the ox, the sheep, the horse, the camel, the dog and the cat, and the "*semi-domesticated*," as the buffalo, the goat, the pig, the rabbit, the reindeer, the yak &c., appears forced and to a great extent imaginary.

The distinction between these two classes of animals is more due to the efforts of the *Breeder* than to *mere domestication*, and I should have thought, that the highest triumphs of some of our rabbit fancies and of our breeds of pigs merited quite as much as our "sheep" to be considered as "*truly domesticated*," if thereby is intended an unnatural deviation from the wild stock, solely produced by the art of the Breeder.

I cannot enter at greater length on this most interesting question, but I hope that some of the readers of this Journal who have perused Dr. Gray's report, will be able to furnish some explanation of the points indicated above.

Another query I would ask is, to what race of *Calotes mystaceus* can Gunther refer to, when he states that "an old male measures nearly 24 inches, the tail taking 19 inches?" Now *Calotes mystaceus* is common in Birma, and more than a score have passed through my hands, but no specimen that I ever saw attained to even 12 inches of total length!



Are not two races or species here united, a smaller one from Birma, and a larger one from Camboja or elsewhere south?

The type in the Paris Museum, Gunther says, is "not full grown," but it was from Birma, and is probably the size of ordinary Birmese specimens.

W. THEOBALD, Jr.



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No. II.—1866.

*Russian Geographical Operations in Asia.—Communicated by Lieut.-
Col. J. T. WALKER, R. E.**

[Received 8th March, 1866.]

TRANSLATION OF A PORTION OF THE "COMPTE RENDU DE LA SOCIÉTÉ
IMPÉRIALE GÉOGRAPHIQUE DE RUSSIE" FOR 1864.

* The Society has never failed to profit by every opportunity that has presented itself, for extending our geographical knowledge of the countries bordering on Central Asia; consequently, in the month of February last year, M. Severstow, a distinguished Naturalist, who was accompanying an expedition into the countries beyond the Ili and the Téliou, was charged to collect information, with a view to preparing a physico-geographical description of all the countries through which the expedition would pass.

* Of the two accompanying papers, one is a translation of a portion of the "Compte Rendu de la Société Impériale Géographique de Russie," for the year 1864, while the other is a translation from the 4th volume of the Journal of the Russian Geographical Society for 1864.

In the first the names are spelt as in the original French memoir.



The Society has just been enriched by highly interesting geographical materials, thanks to the cordial co-operation of its honorable members M. Milioutine, the Minister of War; M. Duhamal, the Governor-General of Eastern Siberia, and Admiral Boutakow.

We have been furnished with a very interesting manuscript chart prepared by the Staff Major. It represents, on a scale of 40 verstes (27 miles) to the inch, the southern portion of the Kirghiz Steppe, or, approximately speaking, the region between the Eastern shore of the sea of Aral, and the Chinese frontier, extending from 76° to 102° of longitude, and from 40° to 50° of latitude, and comprising the northern half of the district called Touran. On this map we have the result of all the geographical operations of the past few years represented for the first time. Until now they had remained isolated, and almost unknown to the scientific world. They greatly modify the general geographical aspect of this region. There are now determined a sufficient number of astronomical points to serve as a basis for an exact cartographic representation of the region above mentioned. We must observe, however, that the fixed astronomical points are as yet very irregularly distributed. They are comparatively numerous in the western part of the map, along the road from Orenburgh to the Syr-Daria, and along the lower course of that river, also along the Chinese frontier in the Eastern part of the map, but, about the middle, they are very sparsely scattered.

We now possess many orographic and hydrographic data, thanks to the military expeditions, and reconnoissances of 1864, and to the operations carried on for several years in the basin of the Syr-Daria by Admiral Boutakow. These data serve to correct the hitherto confused notions of the countries situated within and around this region. We have also received more accurate information regarding the races that people these countries, their mode of life, their migrations, the remains and traces of their ancient condition, and the possibility of their future civilization. We can here only point out the most salient geographical features of the mass of materials we have received, and of which the Society will avail itself for its future publications. The geographical position of all the region above mentioned will have to be considerably altered, more especially as to western Turkestan, and the Khanat of Khokan. For instance, Aouliéta, a town

of Khokan, ought to be shifted, on the map, half a degree towards the south, and one degree towards the east; the town of Turkestan at least a degree and a half towards the south, &c. Similar changes are equally necessary for many other points. The eastern part of this region is essentially mountainous. The principal chain of mountains is found to be a western branch of the Tian Chan; its direction is from east to west from the lake Issik Koul, down to the lower course of the Syr-Daria; these mountains were vaguely known under the general name of Karataou. They may be divided into three groups, the chain of the Kentchi-Alataou, the chain called Alexandrowskaïa, and that of Kazikourt.

The Kentchi-Alataou consists of two parallel chains, which follow the northern bank of the Issik Koul; they are separated (on the east of the Issik Koul) from the Tian Chan by the Pass of San Tasch; their greatest height is 14,000 feet. From this range, a lower range trends in a north-western direction, separating the waters of the Ili from those of the Tchou.

The second group, the Alexandrowskaïa, or the Alataou-Kirghisnyn chain, whose summits are covered with perpetual snow, joins the first at the defile of Baoum, on the western extremity of the Issik-Koul; thence it stretches due west towards Aouliéta, separating the river Tchou from the river Talas; its greatest height is 15,000 feet. To the west of this chain, other hills, rising not higher than 5000 or 6000 feet, stretch as far as the Syr-Daria, following the direction of that river down to Djoulek, and forming, so to say, a prolongation of the Alexandrowskaïa chain. It is to these hills that the name of mount Karataou, which has been wrongly given to the whole system of mountains in this country, properly belongs.

Lastly, the third group forms the Kazikourt chain and lies to the south of the Alexandrowskaïa, from which it is separated by the basin of Talas. The Kazikourt mountains appear to be a continuation of the principal branch of the Tian Chan; winding along the southern bank of the Issik-Koul, they fill the territory of Khokan with their southern ramifications. The disposition of these chains of mountains fixes the watersheds of the basins of the Tchou and the Syr-Daria, the two principal valleys of this country, lying almost parallel to each other. The valley of the Syr-Daria trends, with many

windings, from the south-east to the north-west. The Tchou flows in the same direction. Conformably with the general disposition of the whole mountain system of this region, these great basins are much narrowed towards the east, near Issik Koul, where all the above mentioned ramifications of the Tian Chan are concentrated. It must be observed, that the predominant direction of these chains of mountains, not only in this country, but in all mountainous parts of Central Asia, is always to the north-east. We now have more accurate data concerning the course of the Tchou, especially about its various sources, also its relation to the Issik Koul, from which it does not take its source, but with which it is connected by its affluent, the little river of Koutemalda.

The central portion of the basin of the Syr-Daria has been explored in detail, and with much success, thanks to the expeditions made during many years by Admiral Boutakow, who has quite recently communicated to us the general results of his enquiries, but especially of his late explorations between Fort Perowsky, and the locality called Baïdir Tougai.

It is impossible to set forth here all the accumulated data of these countries of Central Asia, but seeing the interest that they excite, we must add a few more words about their population. It consists chiefly of nomadic Kirghises, and a rather restricted number of Khokans. Their mode of life and degree of civilization correspond with those of the Kirghises who inhabit the country north of the Syr-Daria and the river Tchou.

Their chief wealth consists in cattle, horses and camels. They also cultivate their land and sow wheat, barley and tobacco.

After the military expedition of 1862, a great part of these Kirghise wanderers, from beyond the Tchou, passed into our territory.

To retain these tribes in subjection, the Khokans constructed forts, called Kourgans, in great numbers. Tho four chief ones were Pichpek, Merké, Aouliéta, and Souzak. Aouliéta on the Talas (between the valley of the Tchou, and the chain of mountains which trend from Issik Koul towards the west) has an important position, for it is situated on the grand commercial road from Tachkend and Turkestan, towards the fortifications of Vernoï, Kouldja and Sémi-palatinsk. It is by this road that the caravans come from the southern



regions of Central Asia to go to China, as well as to Russia. On a branch of this road, which stretches towards the north-west, at a junction of the roads of Orenbourngh, Troïtsk and Oufa, is situated the town of Turkestan which encloses within its walls a sacred edifice, the mosque built over the tomb of Azret Sultan.

Passing now to the topographical operations executed in these Kirghise steppes of Siberia, we will mention the surveys that were effected on the western borders of China, under the direction of Colonel Babkow. These operations embrace two distinct circles,—the northern parts of the Tarbagataï mountains, and the valley of the river Borokhoudzir. In the first of these circles, Captain Nifantiew of the Topographical Corps, surveyed the region that is bounded on the *west* by the road which crosses the Khabar Assou Pass, and by the course of the river Tamyrsk; on the *south*, by the chain of the Tarbagataï; on the *east*, by the line of the Chinese posts, and on the *north*, by the Kitchkiné Taou mountains, branches of the Manak, and of the Tarbagataï. This region includes an area of 5,270 square verstes.

In the country beyond the river Tchou, the topographers who formed part of the detachment with the expedition, surveyed the following localities. 1st, From the post of Kastek, by the pass of the same name, to the mouths of the little Kebin, and thence re-ascending the river Tchou, to the mouths of the great Kebin, then 40 verstes of the lower course of this last river. Then again, from the mouths of the little Kebin, along the river Tchou, to the ford of Tchoumitch. All these surveys have been mapped on a scale of 250 sagènes (or 1750 feet) to the inch. 2nd, From the river Talas, crossing mount Kara Boura, to the river Tchotkala (Tchirtchik). 3rd, The marching roads along the valley of the Arys, and those from Tchémkent to Aouliéta, also from Tcholak Kourgen to Aouliéta, have been drawn on the scale of 5 verstes to the inch. 4thly, Plans of the forts of Tokmak, Merke and Aouliéta have been drawn out, on a scale of 250 sagènes to the inch.

We have received from M. Bésae, the Aide-de-camp General, a map of the topographical operations, executed and projected in the country of Orenbourngh, from the year 1861 to 1865, with a Memoir.

The total survey is 17,687 square verstes done in detail, and 3,928 in half detail; 168,178 reconnoitered, and 2,100 triangulated. During



a period of four years, the total amount of survey operations is 212,019 square verstes.

These surveys embrace the following localities ; 1st, the two banks of the river Yany Daria ; 2ndly, the left bank of the Syr-Daria, from the fort Perowsky to Yany Kourgan, a destroyed fortress belonging to the Khokans, and thence to the place called Baildyr Tougai ; 4thly, the northern and southern slopes of the Karataou chain ; 5thly, the mouths of the river Emba, and the Bay of the Caspian Sea at the mouth of this river. Among the newly made maps, the principal are, the map of the country of Orenbourg, on a scale of 50 verstes to the inch ; a new map of Central Asia and the country of Orenbourg, 200 verstes to the inch ; and 24 sheets of a special map of this country, on a scale of 10 verstes.

The Society is continuing the publication and translation of the 7th Vol. of Ritter's Geography of eastern Touran. M. Grigoriew is compiling and making the necessary additions for completing this work, and is carrying on his labours with such activity, that we may look for the first part of his work during 1865.

However short our account may seem of all the important geographical operations in Asia, it is nevertheless sufficient to show that they embrace a large extent of this part of the world, and give rise to questions of both local and general interest. The several expeditions and explorations, in which our Society has taken part, form an uninterrupted chain which extends along our Asiatic frontier, from the Pacific Ocean to the Caspian Sea ; from the valley of the Onssouri and the peninsula of Corea to the Oust Ourt, Turkestan and Khorasan. With the exception of some conflicts with the Khokans, our enterprises along the frontier have been of a strictly peaceful, scientific or commercial character, and our commerce has been considerably developed. These friendly relations are strengthened by an event of great importance which marks the past year, viz., the final pacification of the Caucasus, the point of our Asiatic frontier that is nearest to Europe.

We must now pass on to the hydrographic operations executed in the Caspian Sea, which have always greatly interested our Society.

Last year, our honorable member, M. Ivachinzew, who is the chief of these operations, read out to the Society, at a public meeting,

a remarkable Memoir on the question of the variations of the level of the Caspian Sea. The same persons who carried on these hydrographic operations in 1863, continued them in 1864. At the beginning of the year, the Surveyors were concentrated in the southern parts of the sea, between Bakow and Lenkoran, a region bristling with rocks and volcanic islands. From January up to May, they explored and fixed the positions of several isolated volcanic reefs, which, as they undergo frequent change from the action of subterranean forces, often become very dangerous to navigators, and consequently require frequent soundings and examinations. The materials thus collected, regarding this volcanic region, may some day serve as valuable contributions towards the composition of a complete monograph of this extremity of the Caucasus.

In the month of May, the hydrographic expedition crossed over to the eastern shore, between Tub-Karagane and the gulf of Karabougaz. During the subsequent five months, an extent of more than 200 verstes was surveyed and sounded, chiefly between the isthmus of Manguich-lac and the gulf of Krasnovodsk, under the command of Lieut. Phillippow and Lieut. Dournew of the Pilot Corps. Soundings were also taken by Lieut. Onlsky, in the middle of the Caspian Sea, with an apparatus specially constructed for bringing up specimens of the different soils, and the fossil and animal life they contain.

In June and July Captain Phillipow's party explored the entrance to the gulf of Karabougaz. At the same time, Lieut. Staritzki made some interesting observations on the speed of an uninterrupted current of water directing its course through the Gulf towards the Sea.

The object of these observations was to determine the quantity of water which enters the gulf of Karabougaz, and the quantity of saline particles which is brought there. The exploration of the mouth of the Karabougaz will serve as a basis for a complete study of this interesting gulf. It is the opinion of M. Baer, the Academician, that this study will lead to a solution of the question regarding the variations of saltness in the Caspian Sea. No one will doubt the economical importance of this question, which is intimately connected with the future fisheries of the Caspian. The results of the hydrographic operations are developing gradually, and are partly published. In addition to the maps and plans of different parts of this sea



that have already appeared, a report of the astronomical and magnetic operations is being actually printed.

In speaking of the favourable results that have been obtained by the activity of our Society, we have not had the least intention to attribute it to one more than to another of its functionaries. Among us, individuals change and succeed each other so rapidly, that we cannot say the progress and strength of our institutions rest with them. It is the general conditions of our activity, and the liberal spirit by which they are pervaded, that unite and attract a constant succession of individual labourers. Besides the actual operations of the Society during the past 20 years, a vast amount of labour has been undertaken voluntarily, and without remuneration, by members of the Society, as well as by strangers, in private and in official capacities. Such are the public lectures, which many of our colleagues have delivered without any remuneration, and which have attracted large audiences to our reception Halls. We need not mention, in this place, the number of persons who, during the past and many preceding years, have disinterestedly brought accounts of their labours to the Society. It is doubtless through the liberal spirit which unites and animates all our members and constitutes our strength, that this great amount of work has been accomplished. Religiously to preserve this spirit should be our first duty, and our most sacred obligation.

TRANSLATION OF A PORTION OF THE JOURNAL OF THE RUSSIAN GEOGRAPHICAL SOCIETY, VOL. IV. 1864.

At a meeting of the Society on the 2nd and 14th December, 1864, Rear Admiral Boutakof read a paper on the subject of his last exploration on the Syr-Daria, between Fort Perovski and Baidyr-Tugai (a locality in the Tashkened territory). In 1863 Rear Admiral Boutakof steamed 538 miles up the Syr-Daria, from Fort Perovski. This officer has now explored, determined astronomically, and mapped 1003 miles of that river's course, beginning from its mouth. He expresses his conviction that the river is navigable still higher up, although, for want of fuel, he could not this time proceed further. The general ascending direction of the river from Fort Perovski is towards the south-east as far as the parallel of 43° of latitude; thence it is directly to the south. Throughout the whole distance of 538 miles,

from Baildyr-Tugai to fort Perovski, the river flows in a magnificent mass of water between depressed banks of an argilo-salinous and sandy character, for the most part inundated at high water; there was nowhere either a *break* in the banks, or a stone, for the observation of the geologist. The swamps, after the subsiding of the waters, afford excellent pasturage whereon numerous Aouls of Kirghizes settle for the winter. In the midst of these meadow patches there occur here and there like *islands*, sand hillocks differing in height, from 30 to 40 feet, and overgrown with tamarisk, &c. The dry argilo-salinous banks rise from 7 to 10 feet above the level of high water, and are covered with tamarisk bushes with thorn (growing high and thick), and in some places with the "Turanga" and "Djida." Nearer to our own possessions, large tracts are covered with the "Saxaul." Vegetation is most abundant on the islands, many of which are two miles long. Upon these the "Djida" grows 4 fathoms high, and the thickness of the "Turanga" reaches 10 inches in diameter. Almost all the islands are covered with a dense, almost impassable brushwood, where the Kirghizes declare there are tigers, drawn thither in pursuit of wild boars. The breadth of the river is from 150 to 400 fathoms; the depth from 3 to 5 and 6 fathoms; the current ran at a speed of 7 verstes ($4\frac{2}{3}$ miles) an hour, the average being from $4\frac{1}{2}$ to 6 verstes (3 or 4 miles); the water was of a dirty yellow colour, but when allowed to settle, was very soft and agreeable to the taste. Admiral Boutakof found no evidences of a settled life throughout the whole of the river's course. Patches of soil, cultivated by the poorest of the Kirghizes, occurred at extremely rare intervals; and these were irrigated by water from canals replenished by hand from the river. The Kirghizes generally sow millet, sometimes barley, water-melons, and musk melons in their fields. There are two principal reasons for the absence of population along the banks of this river: firstly, the absolute want of any guarantee for personal security and for the protection of property and labour in the face of perpetual disturbances in Turkestan, Tashkend and Khokan; and secondly, the greater advantage of settling along the rivulets running from the Kara-tau mountains; these afford better facilities for irrigation than the Syr-Daria, which inundates and washes away its banks, and consequently demands an enormous amount of labour for the construction and maintenance of the necessary

embankments. This splendid water-course, navigable to Fort Djulek (the extreme eastern fort on the Syr-Daria line of frontier) which would be a picturesque feature in any other place, is surrounded by a bleak desert, and is now only occasionally enlivened by migrating hordes of Kirghizes, whereas the remains of the ancient towns of Otrar (where Tamerlane died) and of Tunent (destroyed by Tamerlane) which were seen by Admiral Boutakof, and the traces of a once extensive system of irrigation surrounding the ruins of these places, and occurring also in many other parts, are evidences of a once numerous, industrious, and settled population. The shores of the Syr-Daria, above and below Fort Djulek, present a striking contrast. Above Djulek is a howling desert; below, and particularly commencing from Fort Perovski, all is life and activity along the banks. Corn fields and melon fields occur continually, with populous Aouls of well-appointed tents, animated by the presence of herds of cattle. The Kirghizes assemble by hundreds to dig fresh canals for irrigation. Vast tracts of swamp and reeds, which were impassable in 1848, have been protected by embankments against the overflowing of the river and converted into corn fields which now engage the labour of thousands: and all this is exclusive of the localities within 50 or 100 miles of our Forts, especially the neighbourhood of Fort No. 1, where, in the excellent gardens surrounding the Cossack settlements, grapes are grown, and cotton has been sown not without success. Kirghizes and sometimes Karakalpaks constantly migrate from the Khivan territories to the lands under Russian protection, so that they at length find themselves cramped for space. The Khivan and Khokandian forts which stood on the grounds now occupied by the Russians, were the centres of the most merciless and barbarous persecution. The Russian forts, on the other hand, are now guarantees for security, and serve to promote traffic and the general well-being of the natives.

The advent of the Russians did certainly produce a most beneficial crisis in the condition of the Kirghizes of the Syr-Daria.

Within 8 miles of Baildyr-Tugai, Admiral Boutakof's highest limit of ascent, there are the ruins of a small Khokandian fort, Bair-Kurgan, demolished, according to Kirghiz tradition, about 100 years ago. At a distance of 40 miles higher up, on the left bank, are the remains of the town of Tunkat (raised by Tamerlane). This place is



now called Tskilleh, after a saint of that name whose tomb is close by.

There are more Kirghizes grouped about Tunkat than over the entire extent of country traversed by Admiral Boutakof; and to all appearances these were opulent, being possessed of immense studs of horses and camels, and of droves of horned cattle and sheep. Above that place, *i. e.* nearer to Tashkend, he fell in with two rich migrating Aouls, one encamped by the side of the river.

Descending the Syr towards the river Arys, an open space becomes visible beyond the zone of reeds, at 4 or 5 miles from the river, studded with clayey sand mounds that are covered with a scanty and low brushwood. Some of these mounds are evidently artificial. On a sort of tableland, within 7 miles in a direct line, and almost due north from the mouth of the Arys, are seen the remains of what may have been the citadel of the ancient town of Otrar.

From the mouth of the Arys to the little fort of Utch-Kayuk, abandoned two or three years ago by the Khokandians, and built on a marshy soil, the distance is $84\frac{2}{3}$ miles. The character of the river here is still the same, the same bends and islands, the same depressed banks, mostly flooded, the same vegetation along the shores and on the islands. The forts Utch-Kayuk, Din-Kurgaon, Yang-Kurgaon, Djulek and Ak-Mechet, (now fort Perovski), Kumysh-Kurgaon, Chin-Kurgaon, and Kash-Kurgaon (the three latter below fort Perovski,) were the rallying points of the Khokandians, for the subjugation of the Kirghizes, and the centres for the collection of tribute and the general merciless oppression of that people. Yang-Kurgaon, raised by the Khokandians in 1857, and Din-Kurgaon, erected in 1860, were the last points of Khokandian resistance against the spread of Russian influence; here also the last attempts were made by the Khokandians to retain under their yoke the Kirghizes who passed over in masses to place themselves under our protection. Yang-Kurgaon fell in 1860 to the Russian arms; Din-Kurgaon in 1861. Utch-Kayuk is the nearest place to the town of Turkestan; it was visible from the river, being situated in a hollow of the foreland of the Kara-tau mountains.

The only affluents of the Syr seen by Admiral Boutakof are the rivers Arys and Sauran-Su, falling into the Syr on its right bank

opposite the An-djar settlement, $8\frac{2}{3}$ miles below Uteh-Kayuk; other rivers emerge from the Kara-tau mountains, namely the Tuitchke whereon Turkestan is situated, the Karaichik, 6 miles lower down, and the Sart-Su; these do not reach the Syr-Daria, but lose themselves in the marshes formed by its inundations.

Below Uteh-Kayuk the country at first is inundated, and large wet meadows, or more correctly morasses, extend along both banks of the river, but further on, especially on the right bank, land is firmer.

Nearer Djulek the trees on the banks are higher and thicker than along the whole remaining portion of the river's course. In the immediate vicinity of this Fort, there is a very pretty avenue of tall and thick willows, looked upon by the Kirghizes as a sanctuary (Aulie).

Between Djulek and fort Perovski the banks are generally firm and salinuous, but not elevated. The "Saxaul" is very abundant at the Kasakty-Syra, Chagouon and Kushsant settlements, and opposite Burinbai. The islands and the continuing banks are covered with the "djida," "turanga," and occasionally with willows, and the margins are usually clothed with high dense thorn and reeds. Sandy hillocks occur beyond the saline plains, and in many places Kirghiz tombs and the remains of long neglected irrigating canals are met with.

From the 14th July, when the expedition was proceeding upwards and was within 67 miles of Uteh-Kayuk, the waters were visibly subsiding, and daily decreased, though the heat continued to be great, up to 30° R. in the shade. This was doubtless owing to the exhaustion of the supply of snow which accumulates on the mountains, where the river takes its rise. At fort Perovski the water began to fall only from the 30th of July, and at Fort No. 2 from the 5th of of August (N. S).

Notwithstanding that Admiral Boutakof's expedition had to halt at night close to marshy lands, there were no cases of ague, and so far as he was able to judge, the climate on the Syr-Daria, in its upper as in its lower course, was healthy. His astronomical observations disclose great inaccuracies in this portion of the map of Central Asia which is founded on the determinations by the Persian Missionaries of the 18th century.



The communication made by Admiral Boutakof, who has long distinguished himself by many years of labour in this region, was listened to with great attention, and received with great enthusiasm. We could not give here more than the mere outlines of the paper, which he is now preparing for the press, and which will appear with a map of the Syr-Daria. There is no doubt that Admiral Boutakof's work will be an agreeable acquisition for modern geographers.

Kashmir, the Western Himalaya and the Afghan Mountains, a geological paper by ALBERT M. VERCHÈRE, Esq., Bengal Medical Service; with a note on the fossils by M. EDOUARD DE VERNUEIL, Membre de l'Académie des Sciences, Paris.

[Received 11th March, 1865.]

INTRODUCTION.

Of all the great chains of mountains on our Planet, the most stupendous is, singularly enough, the least known to the geologist. Many fossils have indeed been collected by travellers in the Himalaya, and a few have been determined; but satisfactory sections and careful descriptions are very scarce, and it has not yet been found practicable to attempt any general grouping and arrangement of the rocks and beds of these mountains. Jacquemont's researches in Kashmir have not, I believe, much advanced our knowledge of the geology of the country. Mr. Vigne was no geologist, and his observations were not sufficiently accurate for scientific purposes; the same remarks apply, more or less, to most visitors who have published what they saw amongst the higher ranges. Captain R. Strachey, R. E. in his papers on the geology of the Himalaya, between the Sutlej and the Kali rivers, gives a map and two sections which are of great interest; they do not, however, refer to the portion of the Himalaya which I have studied, and they leave yet a vast field for more precise investigations. I regret not having been able to consult Capt. H. Strachey's paper

on the physical geography of Little Thibet, and Dr. Thompson's work on the same country ; neither have I had the benefit of Mr. Medlicott's Memoir on the southern ranges of the Himalaya, between the rivers Ganges and Ravee, nor any of the other papers which have been written on the Sub-Himalayan ranges.

Of the geology of Kashmir especially, I believe that very little indeed has ever been published, and that not even a geological horizon has been discovered. Mr. Vigne and Dr. A. Fleming reported having found in Kashmir, "Nummulitic limestone disturbed and calcined by greenstone;" this was an error of some importance, as it gave a false datum from which to fix the age and relations of the Azoic rocks. Dr. A. Fleming, in his report on the Geological Structure of the Salt Range, published in Selections from Public Correspondence of the Punjab Administration, Vol. II., 1855, has the following passage:—

"From Kashmir, too, Mr. Vigne obtained limestone *containing nummulites*. This we have seen in situ on the side of a mountain at the upper end of the Manus Bal lake, where it is much disturbed and calcined by greenstone. It probably forms the summit of many of the higher hills on the northern side of the Kashmir valley, a district fraught with interest to the geologist and hitherto quite unexplored."

When I arrived at Srinuggur, Mr. Drew, who had visited Manus Bal, showed me some specimens of the limestone of that locality, and expressed a doubt about the markings seen on the rock being nummulites ; he considered their markings to be the result of crystallisation and weathering ; but I could not accept this view, and regarded the little marks as indications of organisms. I was unwilling to believe that Dr. A. Fleming could possibly have made a mistake about nummulites, after the experience he had had of their appearances in the Salt Range and the Bunnoo district ; and, as Mr. Drew acknowledged that he was not familiar with the nummulitic formation, and the specimens shown me were very bad and ill-preserved, indeed merely faint marks in a coarse limestone, I temporarily admitted Dr. Fleming's view. I was, at the time, unable to visit Manus Bal, or to absent myself a single day from Srinuggur, owing to great sickness amongst the visitors ; but I had the good luck to discover a bed of fossiliferous limestone and shales within a few miles of

Srinuggur. These beds were near enough to enable me to ride to them in a few hours, and I soon found that they contained the same forms as were known to occur in the dressed blocks of limestone (obtained from Buddhist ruins) of which the river-walls and river-stairs of Srinuggur are built, and I also found the remains of one of the antique quarries near my favourite locality. Ultimately, the rocks reported to be nummulitic were found to be carboniferous, and the so-called nummulites, rings of Eocrinite-stems; the volcanic rocks were also ascertained to be palæozoic in age and not intrusive. (See para. 53, where the Manus Bal limestone is described in detail.)

To my friend, Captain Godwin-Austen of the great Trigonometrical Survey, I owe my best thanks. I had wished that this paper might have been written in conjunction with that gentleman, and it would have been well for the reader, if it had been so; but as Capt. Austen went to Bhotan and I to Bunnoo, such a hope had to be abandoned.

In drawing up the map, I have used for its topography whatever materials I could procure, but I have not had the benefit of many recent discoveries and surveys. The compilation was made from works of very different values. Kashmir, Hazara and the British Trans-Indus districts are, I believe, tolerably accurate; the Salt Range is less so; whilst the Korakoram Chain, the Hindoo Koosh, Kaffiristan, Chitral, Kabul, etc. only lay claim to give a general outline and direction of the ranges, valleys and rivers. About the Hindoo Koosh, I much regret not having been able to avail myself of the maps of Kaffiristan lately published in the office of the Surveyor General of India.

It may appear, on seeing how little of the Afghan mountains is geologically coloured, that there was no necessity of extending the map as far as the Hindoo Koosh, but I hope that the advisability of having sketched in this chain will be acknowledged, after reading the fourth chapter of this memoir.

The geology of the map is partly from my own observations and partly from information obtained from friends and travellers; I have endeavoured to enter nothing which did not appear pretty certain. I have been able to sift satisfactorily a good deal of the information obtained, by means of specimens which were either shown or given to me.

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I have added a few sketches of fossils which, I hope, will be found sufficiently well done to enable the organisms to be easily recognized. The forms sketched are those which have appeared to me most characteristic of the beds met with.

The two parts of which this paper consists are nearly separate memoirs. In the first, chapters 1 and 2, a description of the mountains of Kashmir is given in some detail. In the second theoretical views are discussed; but as Kashmir is merely a small portion of the Himalaya, it was found impossible to understand many fossils without taking such general views as referred to the whole mass of the chain; and, further, as the Himalayan chain is supposed by me to be intimately connected with the Afghan mountains, these mountains had also to be considered. In order to be intelligible, it became therefore necessary to write a cursory survey of the Afghan-Himalayan regions; this is done in the 3rd chapter. It is of course very superficial and incomplete; yet I hope that it may not be without some interest. On the data furnished by the first three chapters, the hypotheses advanced in the fourth are based.

I have not entered into many details on the eocene and miocene formations (except incidentally), as it would have lengthened to undue proportion this already too long paper; these formations deserve to be studied by themselves. The same remarks apply to the Jurassic and Saliferian rocks. In chapter 3, however, a few words will be found on the nature and relations of these beds. The principal object of this paper, in its descriptive portion at least, has been a study of the older rocks, viz. Silurian and carboniferous, together with the volcanic and metamorphic rocks.

I trust that the many imperfections and errors which cannot fail to occur in a memoir of this nature, will not be too severely criticised. My excuse is that this paper was prepared at one of the out-posts of the Punjab Frontier, where I had not the usual assistance of a Museum and a Library. Such as it is, I hope that it may not be without interest to some of the members of the Society who are fond of geological researches.

CHAPTER I.—*Felstone and Porphyry.*

The mountains South-West, South and West of Cashmir.

Baramoola is a small city, well known to the tourist in Cashmir and to the pedestrian coming from Murree; it is a haven of rest, for here boats may be hired to take him to Srinagar, the very heart of the valley. From the heights above the town the traveller gets his first view of the celebrated vale, and in the spring of the year it is difficult to imagine any more beautiful landscape than it affords. It is here also that disappointment or enthusiasm commences, according to the traveller's disposition: for to many Cashmir is an overrated land, whilst to the scientific man, to the artist or the antiquarian it is a mine of great wealth.

The town is built at the foot of a hill which has a direction west to east, and is cut in two to give a passage to the river Jheelum. It is approximatively in N. Latitude $31^{\circ} 13'$ and E. Longitude $74^{\circ} 23'$. Its southern view is limited by a small hill, the Atala, and on the west a mountain of 8,467 feet, the Shumalarum, also confines the horizon. Thus, placed in a cradle of hills, on the banks of the Vedusta, it has a picturesque aspect, a damp cold climate, a celebrity for rain and storms, and a great name for earthquakes.

The hills at the foot of which Baramoola is built are the extreme eastern extension of the great Kaj Nag Range, which, proceeding from E. to W. for 20 miles, bifurcates into a huge north-westerly branch (which I shall leave alone for the present, as I know nothing about it), and a southern branch which, proceeding S. S. W., divides again, one arm going west towards Mozofferabad, whilst the other, the Kiren or Kirna range, crosses the river at Ori (or rather the river crosses it) to be continued with the Kandi range in the direction of the Pir Punjal chain.

2. The whole range of hills near Baramoola dips S. by a few degrees E., and in describing the rocks from S. E. to N. W., we shall therefore proceed from the more superficial to the deepest.

On the left bank of the river, we find a clinkstone or felstone of a dark grey colour and slaty texture, and an appearance as if it had been drawn while in a viscid state. It has a sandy feel to the hand; it breaks into long narrow flags having a close resemblance to pieces of

pine wood which have been cut and prepared for burning, and have weathered grey by exposure. It has a well marked stratification, which is cut obliquely to its plane by a slaty cleavage which forms with it an angle of about 113° . It has also a series of parallel joints, about 2 or 3 feet apart, and which cut the stratification at right angles but form with the cleavage an angle of 67° . The joints are usually lined by a coating of quartzite, and both quartzite and felstone are occasionally stained by iron.

The felstone appears to be entirely composed of elongated and flattened granules of felspar or albite, which has a sub-vitreous lustre when closely examined; it has a dark bluish-grey colour, but weathers ash-grey and even dirty white and some pieces which are very fissile, assume somewhat the silky appearance of amianthus. The colour of the paste appears to be due to augite; this, by decomposition, lets free a certain quantity of iron which causes the surfaces of cleavage and stratification to be covered by a powdery, rusty incrustation. Sparingly disseminated in the mass are seen minute fusiform nodules of dark shining augite; these nodules are never crystalline. Some strata are extremely thin-bedded, like sheets of paper, and fall to pieces very easily, ultimately decomposing into a brownish earth. Other strata present an alternation of very thin laminae of nearly white and dull albite, and a dark grey shining mixture of felspar and augite, so that, when the rock is broken vertically, it appears striped white and grey.

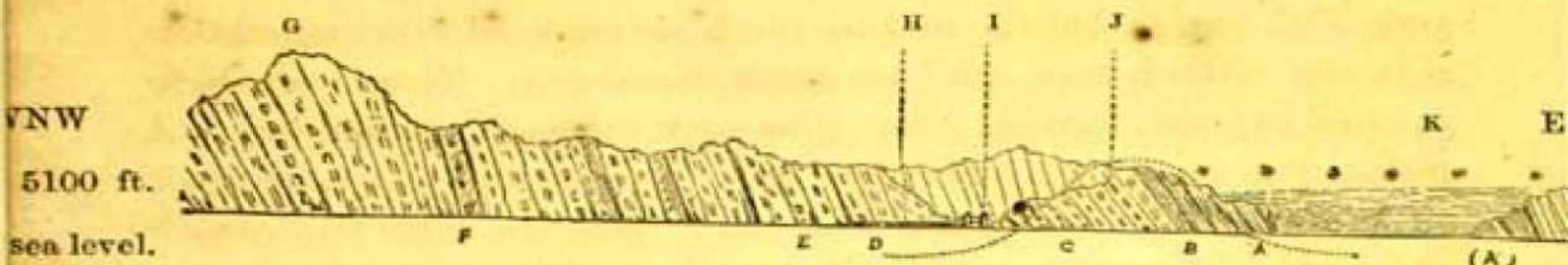
3. The above beds dip S. and a few degrees E., with an angle of 60° near the Atala hill, but the angle diminishes as we go towards the N. W., being no more than 45° , near the river at Baramoola. For two miles along the left bank of the Jheelum, this felstone was observed with, here and there, a band of amygdaloid interbedded. But I made too superficial an examination of the Atala to enter here into detail. Crossing the river to the right bank, we find that felstone also forms the hills which overhang Baramoola. Just over the city, it is similar to that of Atala, but as we proceed towards the N. W. and therefore see deeper beds, the character of the beds changes considerably. There is a beginning of separation of the minerals of the felstone, the dull white albite forming by itself innumerable penicilli having the shape of extremely elongated spindles which are imbedded in the grey felspathic paste. The rock has still,

however, a well marked stratification which is rendered very conspicuous by the white penicilli being parallel to it. There are also cleavage and joints as before, but a great deal more quartz in the latter.

The next beds, lower down, are much lighter in colour and more compact in structure. The paste is ash-grey, felspathic and dull looking, but instead of the penicilli noted before, we have here regular almond-shaped masses of white saccharine albite, usually about one inch long and two-tenths of an inch across, but often made larger and with the albite in the state of a fine incoherent sand. Then rocks, like the one with penicilli, but bluer in tint and interbedded with amygdaloidal greenstone and felspathic ash, containing oval nodules of augite, extend to the west, as far as the Shumalarum which they appear to entirely compose.

The angle of dip, on the right bank of the river, is again very great, being about 60° , and the beds are a good deal faulted. One fault has a direction N. E.—S. W. and the river runs in it at Baramoola. It is continued in a ravine on the right bank of the river, about a mile below the town. The angle of dip is not the same on both sides of the fault, and there has been a slight down-throw on the south. The Jheelum, while in the fault, is narrow but navigable; at the ravine, it turns suddenly to the south, quitting the fault and passing over a band of rock which stretches from W. to E., thus forming a small rapid. From this place to Ori, where the Jheelum enters the Sub-Himalayan tertiary sandstones, the Vedusta follows its course across the much up-tilted beds of felstone, changing its character of a winding, placid, broad and shallow river into that of a boiling, rapid, deep and narrow torrent, and forming, as it were, a succession of small falls and cascades all the way down. The thickness of the felstone near Baramoola is enormous. I can form but a mere appreciation, not having followed the beds sufficiently far to the west; but I am certain that it is much above 5,000 feet.

4. The following section (marked I. on the map) is merely a diagram to enable the reader to understand the position of the beds. It is oblique and not at right angle to the dip.



- A. Dark grey felstone, slaty, stratified and with a cleavage and joints. Fusiform, elongated, minute granules of augite. Many thin-bedded strata, about 400 feet.
- B. Felstone like A, interbedded with strata of felspathic ash containing nodules of augite, 30 "
- C. Rough trachytic clinkstone or felstone, breaking in elongated slabs terminated by oblique, clean joints generally lined with quartzite, 500 "
- D. Bluish grey felspathic paste with innumerable penicilli of white powdery albite, 500 "
- E. Pale grey felspathic paste with almond-shaped masses of albite, either powdery or compact and saccharine. Beds of ash interstratified, 400 "
- F. A succession of beds similar to D. and E. interstratified with bands of amygdaloid and of felspathose ash containing oval nodules of augite. This rock appears to form the whole of the Shumalarum, and was seen, as far as I could see, towards the west.
- G. Shumalarum, 8467 ft.
- H. River Jheelum or Vedusta.
- I. Baramoola.
- J. The dotted line is the Atala.
- K. Lacustrine Clay and Boulders.

5. The rocks, which I have endeavoured to describe, are continued along both banks of the Jheelum as far as the fort of Ori, about twenty five miles south of Baramoola. Following them on the left bank, (Murree Road) we first cross the Atala, and can observe, near the village of Mihrur, very fine narrow slabs of felstone, twelve feet long, used as rafters to support a roof over a holy well or spring. Proceeding S. W. we cross a small marshy valley, and near the village of Ghaut Mullah we meet a succession of spurs directed towards the N. W., and which are the extreme north-western extension of the Pir Punjal Chain. These spurs are also made up completely of felspathic flagstone, identical to that which I have described above, but the dip and strike of the beds are different from that of the beds near Baramoola: the dip is W. with a

very high angle, but the rock is much decomposed, the vegetation rich, and little is seen until we reach Nausherra. Thence, the beds are well exposed, forming lofty cliffs over the path, of a grand and picturesque aspect; they are often quite vertical and seldom form an angle with the horizon of less than 85° . But the same force which has made those strata stand on end, has also broken them and wheeled round enormous sections of the beds. Even a superficial examination shows that portions of the hills, some thousands of yards long, caught as it were between two faults and thus set free in their movements, have been made to rotate on themselves, the strike changing its direction from a few to ninety degrees. Thus, near Buniar, the strike is N.—S.; a little further south it is W.—E.; four miles before we get to Ori it is W. 15° N.—E. 15° S. and the dip is southern and only 45° . At Ori the strike is again about N. W.—S. E. and the dip northern and 80° . But it is often difficult to see the stratification in these laminated rocks, as cleavages and joints are generally better marked than the stratification. The general strike, however, is from N. a few degrees W., to S. a few degrees E., and the dip is northern.

Between Nausherra and Ori, the felstone presents several appearances. The bulk of the hills is made up of a pale grey and extremely laminated felstone, having much the appearance of slate, and being crossed by numerous veins of opaque quartz. These veins are sometimes so thick that they form bands of quartzite. Near Ori, some beds are seen having the appearance of metamorphic chloritic slates. Others are made up of very thin-bedded felstone of an earthy appearance, and are wonderfully wavy and crimped, whilst the beds above and below them are but gently undulated. It appears probable that these thin-bedded layers were deposited by water during periods of volcanic inaction, and that when the covering felstone contracted in cooling, the aqueous deposit was gathered in zigzag folds. They ought, therefore, to be considered either as an ash arranged by water, or as a laterite derived from the surface of decomposing felstone, and having the same composition as its parent rock.

6. About half way between Buniar and Ori, is a small Buddhist ruin concealed by brambles and wild roses, and built of a dark grey rough trachy-dolerite. This rock was obtained from a thick band

which is well seen close to the ruin. It is divided into somewhat prismatic blocks by joints; it is generally compact, but sometimes scoriaceous, and it appears to have had some influence on the cooling of the felstone above and below it, this being much more compact near the trachy-dolerite, and becoming gradually more laminated and slaty as we get further off. I cannot say whether the trachy-dolerite is intrusive, or interbedded; but it is perfectly conformable to the felstone.

7. At Ori, we find a small valley sunk between high mountains and crossed by a tolerably big ravine and by a torrent flowing from the S. E. to N. W. This torrent divides the hills on the S. W. which are miocene sandstones and shales, from the mountains on the E. and N. E. which are volcanic. The Jheelum describes a semi-circle round the extremity of the Kiren range, the beds of which cross the river to be continued with those of the Kandi or Kanda Range, which are the link between the Kirna Range and the Pir Punjal Chain. The river runs for a little while between the volcanic rocks of the Kirna and the miocene sandstones, but it very soon leaves this bed, and cutting a canal through the tertiary sandstones and clays, bids farewell for ever to rocks of a volcanic origin.

8. I will not enter into a description of the tertiaries in this paper, though we shall have to see much of them incidentally, but as it has been said and written by many persons that the miocene sandstones and clays dip under the volcanic felstone (generally described as metamorphic schists or quartzose mica-slate), I must correct the error, while we are at Ori. Both the volcanic and miocene beds are nearly vertical, but not quite, and dip northerly, and there is therefore an appearance of the miocene dipping under the felstone. On examining the high bank of the Jheelum, however, not far from the fort, I could see the miocene beds bend backwards, thus showing that they

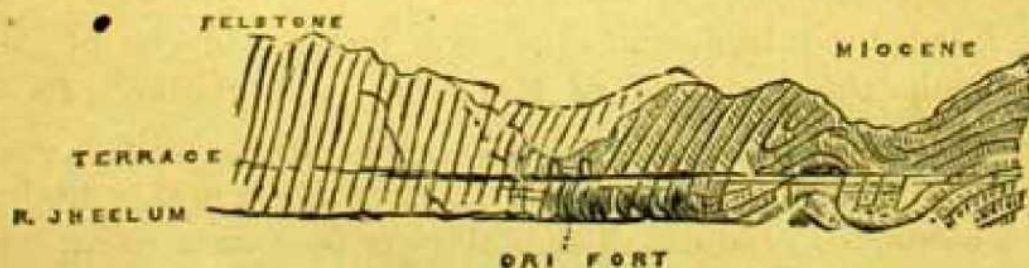


fig. 1.

are superior to the volcanic rocks, but have been dressed up against them by a lateral pressure. The diagram (fig. 1.) shows well the folded



disposition of the miocene and the bending backwards of the beds in contact with the felstone. These beds are partially concealed by a very high river-terrace of conglomerate, but this has been washed off in many places and the rocks are left uncovered.

There is, in the Sub-Himalaya, sufficient evidence of miocene sandstone having been mostly raised by a lateral movement; there appears to have been a reflection, a *refoulement* of the miocene beds towards the S. and the W., as if the enormous masses of the central chains had surged up through a chasm of the earth's crust and forced the sandstone aside, instead of lifting it up. And thus the volcanic rock of my diagram would have pressed against the miocene, and curbed up and bent back the yielding plastic beds of sandstone and clay.

9. Returning now to Buniar, half way between Ori and Baramoola, we cannot fail to admire the remains of a Buddhist temple of considerable size and great beauty. It is built of a white porphyry, and of this porphyry we must now speak in detail.

The stones of the temple were obtained from huge blocks which are strewn on the river terraces on both sides of the Jheelum, in the neighbourhood of Buniar. Some of these blocks are of enormous size: one I noticed is about 20 feet above ground and nearly as thick and broad as it is high. No water-power could have moved such enormous masses, and they have evidently been brought down by glaciers. I have been told that Mr. Vigne supposed them to have been brought by icebergs floating on a huge Kashmir lake, but we need not go so far for their origin, as the Kaj Nag peaks, seven miles to the north, and the Sank or Sallar, eight miles to the south, are mostly composed of this porphyry. A glance at the map will easily demonstrate how glaciers, filling up the narrow valleys of the Harpeykai and the Khar Khol, brought down to the river-terraces blocks of porphyry detached from the summits of Kaj Nag and Sallar (13,446 ft. and 12,517 ft.). I had not time to visit these valleys and look for ancient moraines, but some blocks show striæ and scratches such as glaciers alone can produce. These glaciers no longer exist, but their disappearance is only the result of a change of climate of the Himalaya, which is abundantly proved to have taken place at a very late

than the other. Two such plates are applied one against the other by their greatest surface, but one of the plates has (apparently) rotated half a turn, so that A of one plate is opposite B of the other.

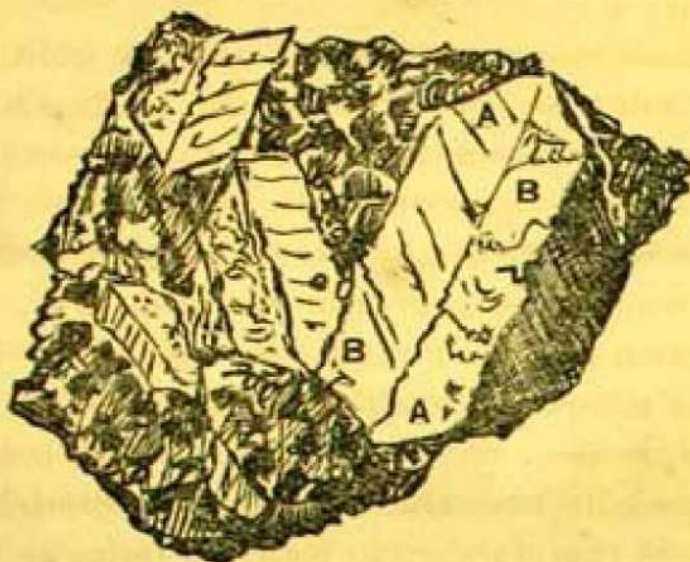


Fig. 2.

This rotation is of course only apparent, but it appears to have taken place from the cleavage of the two plates being opposite, so that when we look at a section of the double crystal (fig. 2), one side presents the shining striped surface of a lamellar cleavage, whilst the other shows the dull rough surface of a fracture across the grain. This opposition of cleavage is probably due to a play of opposite electricity generated during crystallization, but it gives the idea of one of the plates having made half a turn before applying itself against its fellow.

The perfect crystal is rarely seen; it is generally broken across, and the section (fig. 2) is conspicuous on the surface of the rock, so that, at first sight, one may fancy the crystals to be prisms, and a little trouble is necessary to understand the arrangement of the twin plates. This made is therefore, to all appearance, a twin crystal of one of the numerous modifications of triclinic albite.

By exposure to the atmosphere, the porphyry crumbles easily and falls to a coarse gravel which is soon converted into a very white sand. While the rock is still hard and sound, the large crystals

of albite sometimes become loosened in their matrices, and, falling out, leave angular cavities on the face of the rock. The rock, when fresh and well crystallized, is however very hard: some varieties appear to crumble much more quickly and completely than others.

II.—The grains of magnetic iron ore and the gold I have not seen in the porphyry,* but they are found in the sands which, I will now endeavour to prove, have been formed by the decomposition of these volcanic rocks.

Gold is washed in most of the rivers which traverse the miocene sandstones and conglomerates of the sub-Himalaya, and is always found associated with grains of magnetic iron ore. Let us examine one of the districts where the washings are, I believe, most abundant, the banks of the Soane river, in the districts of Jheelum and Rawul Pindee, especially near the villages of Pindeh Geb, Kothair and Mukud. Let us therefore go to Rawul Pindee and travel towards the S. W. along the road to Kalabagh. We find that this dreary road, about 120 miles long, crosses obliquely from the N. N. E. to the S. S. W. the great plateau of miocene sandstone, conglomerate and clay (Sect. G.).

There is a thick bed of miocene sandstone and conglomerate, above 2,000 feet thick, which might be called the upper miocene formation of the Sub-Himalaya (contemporary of the Sewalik hills and containing the same Mammalian fossils), whilst the sandstone and shales of Murree and adjacent hills, about 5,000 feet thick and without fossils, might be regarded as the inferior miocene. These two divisions of the miocene are not exactly one on the top of the other, but rather the upper bed thinning towards the north, covers in the southern edge of the lower bed in an intricate

* A similar granitoid porphyry exists in Portugal, in the hills near Cintra about five leagues from Lisbon. It is there very variable in appearance and consistency, and is generally made up of large grains of felspar and of quartz, and of large plates of mica. It contains grains of magnetic iron ore, but I am not aware whether it contains the large twin crystals of felspars seen in the Kaj Nag porphyry. The Portugal rock is generally described by travellers as granite, but is considered by geologists as decidedly volcanic. It presents the character of crumbling easily after a certain amount of exposure.

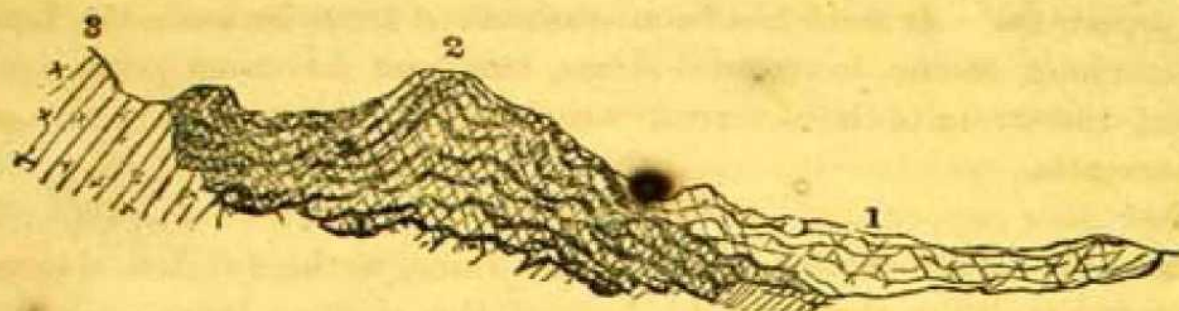


Fig. 3.

manner, as represented in the accompanying diagram (fig. 3) : 1, Upper Miocene with Mammalian Bones ; 2, Lower Miocene without fossils (excepting a few roots and stems and imprints of leaves) ; 3, Porphyry and Felstone, &c.

The upper bed is therefore not seen near Murree, whilst the lower bed is equally absent from the great plateau of Rawul Pindee, where the fossiliferous sandstone is always seen to rest directly on the Nummulitic formation, wherever this breaks through the miocene. The bed we have to deal with here is, therefore, the upper miocene only. It is much folded and faulted, forming stray folds and many faults at both extremities of the bed, and rolling in broad undulations in the centre of the plateau. Now, if we examine the much up-tilted beds near Futteh Jung, Nusrulla, or else close to the Salt Range near Kalabagh, we find them composed of a grey or greenish calcareous sandstone, of conglomerate and of sandy indurated clays containing nodules of kunkur. These beds look like inclined and parallel walls sticking out of the alluvium, and separated one from the other by open spaces or intervals ; and one may at first sight fancy that the several strata have been wrenched apart at the time they were upheaved. But if we examine the beds where they are nearly horizontal, as in the neighbourhood of the Soane river near Kothair or Jubbie, we find that they consist of a hardly cohesive sand, very white and composed of minute grains of albite and quartz, with black grains of augite and spangles of mica. I have been in the habit, in taking notes, to call this sand, Pepper and Salt sand, and I shall here make use of this term, as it is a convenient one. Interstratified with this sand we find the beds of grey or greenish sandstone, of conglomerate and of sandy clay noted at Futteh Jung ; and it becomes evident that at the places where we first observed the beds, and where they are much tilted up,

the pepper and salt sand has been washed out from between the harder beds, whilst in the horizontal strata, the sand has been protected by one of the strata of harder rock which acted as a roof over the sand underneath.

Now this pepper and salt sand is the one washed for gold. The washings are done during and after the rains, as the swollen waters of the torrents bring down to the beds of the rivers a large quantity of fresh sand. It is washed in the usual manner, and gives a residue of a black sand which is composed of shining grains of magnetic iron ore and grains of augite. A little more washing in a smaller vessel removes the augite and a great part of the iron; and the gold, which is rarely visible with the naked eye, is picked up by mercury.

If we examine the pepper and salt sand in situ, we shall very soon become convinced that it is nothing but the porphyry of the Himalaya ground down to powder, for we find in it numerous pieces of the porphyry not quite crushed to sand. I have found some of these pieces half an inch long and composed of a hard fragment of albite supporting specks of augite. Pieces of the large felspathic crystals I have seen also, and the smaller crystals of quartz are frequent and hardly altered and rubbed. The sandstone consists mostly of undecomposed albite and augite. It is not easy to describe in words the great similarity between the porphyry and the white sand, but their complete identity strikes one at once when we study the beds. Dr. Fleming made therefore a good guess when he wrote the following passage: "We have been quite unable to trace the source whence the gold has been derived, and are not aware that amongst the quartzites and quartzose mica slates (felstone is meant,) which are much developed in the Punjal Range, near the Baramoola Pass into Kashmir, and stretch west into the northern Hazara mountains, the metal has ever been detected in situ. From similar rocks there can be little doubt that the auriferous sands have been derived."*

And again he writes: "In the neighbourhood of the Salt Range the scales of gold are small and almost invisible, but we have heard from natives, that, in Hazara, grains of gold are sometimes found of a size such as to admit of their being picked out of the sand. If

* Report on Geological Structure of Salt Range; Selections, P. Govt. Vol. II. 1855, page 342.

this be true, we may infer that the auriferous source is somewhere to the north, and that by tracing the gold stream, so to speak, we might arrive at a point where the drifted materials become coarser, and where the gold, from its high specific gravity, has been deposited in larger quantity."*

That the miocene deposit of the Sub-Himalaya has been derived from the mountains situated N. or N. E. of it, is evident from the boulders contained in the conglomerates of the formation, these boulders being mostly volcanic rocks, such as we have seen in the mountains near the Baramoola, and such as we shall see in other parts of Kashmir. We will see, by and bye, that these volcanic rocks extend to the west, along the northern boundary of the Peshawur valley, as far at least as Jelalabad, and to the east as far, at any rate, as 80° east long., and probably much farther, though it appears from Captain R. Strachey's memoir on the geology of part of the Himalaya mountains,† that the volcanic rocks in the eastern portion of the Himalaya are more intrusive than they are in the western extremity of the chain.

If it is indeed true that grains of gold of some size are picked out of the sand in Hazara, some valuable diggings might yet be found in the valleys situated between the spurs of the Kaj Nag range or its extension to the west. But I cannot help thinking that, with a population everywhere anxious to wash gold even in very poor washings, auriferous sands of any economical value would have been worked long since, especially as the sands formed by the decomposition of a porphyry, similar to that of the Kaj Nag chain, and situated on the eastern frontier of Kashmir are searched for garnets only.

The magnetic iron ore is tolerably abundant in the pepper and salt sand, and is at present wasted by the gold-washers of Kothair and Mukud: but it has not been always so. In traversing the great miocene plateau of Rawul Pindee, I noticed for many miles along the road, between Pindeh Geb and Jubbie, small pieces of black slag, often in some quantity and evidently very old, as many pieces were seen where ravines had cut the ground, buried a foot

* Ditto ditto, page 344.

† On the Geology of part of the Himalaya Mountains and Tibet, by Captain R. Strachey, Bengal Engineers, F. G. S. Proceedings of the Geological Society of London, 1851.

and half below the surface. Knowing nothing then of the magnetic iron sand, I could not conceive whence the slags came, but on seeing the large quantity of iron ore which is washed out of the sand by the gold-diggers, I was forced to conclude that a time had been when the iron powder was saved and smelted. It is not such a poor undertaking as it might appear to wash iron from sand, especially as the gold alone would pay the men 3 or 4 annas a day, and a very little arrangement would save the iron. It contains about 70 per cent. of metal of the very finest quality and the very best to make steel. It resembles Swedish iron, and it is the same as the Kangra iron which has been proved to be of excellent quality by experiments in England. It is very dear, selling at £14 a ton. It is probable that the smelting of this iron sand was discontinued from the want of fuel, which is now very scarce on the plateau. That fuel was once more abundant, is sufficiently proved by the amount of travertin seen in many places where no springs exist now-a-days; and these fossil springs, if I may call the travertin by that name, tell us of a time when a higher jungle on the plateau and forests on the hills arrested a good deal of moisture, and wrung from the humid monsoons a portion of the rains which are now poured on the Himalaya. It would be, I imagine, easy for the local government to find out whether the magnetic iron ore is still smelted in some localities in the district, or when the smelting was discontinued, and to resuscitate the trade, the iron ore being brought to Mukud from the neighbouring villages, and there smelted with charcoal brought down in boats from the Akora Kuttuck hills or from Hazara. Excellent limestone is abundant near the banks of the Indus ten or twelve miles above Mukud. It is also abundant in the conglomerate on which Mukud is built.

The smelting of this iron sand would not, of course, give profits or yield a quantity of metal worth mentioning in comparison to the results of European industry, but it might be a valuable enterprise for natives possessing some little capital, and might much ameliorate the miserable condition of the gold-washers.

12.—Returning now to Buniar and the Kag Naj range, I must insist on the very changeable appearance of the porphyry. We have seen that it consists of a granular mass, with large crystals of albite, small crystals of quartz, crystals of garnet, plates of mica and lamellæ

of augite, and that any of these crystalline minerals or all of them may disappear, leaving a rock entirely composed of a saccharoid paste of albite. At other times the quartz becomes very abundant, and thick bands of white quartzite traverse the mass. Again, the augite, which is sometimes wholly wanting and at others in very minute specks only, may increase and at last predominate and form dark rocks with a semi-metallic lustre, the augite being generally collected in masses of aggregate plates having the lustre of iodine. It very often happens that the minerals are arranged in bands or layers as in gneiss, and this apparent foliation also varies much, and often it does not exist at all, whilst in other instances it is extremely well marked, thus gradually forming a passage to the clinkstone, described in the beginning of this paper.

13.—I have not visited the high summits of the Kaj Nag : indeed, I have only seen a few spurs of this enormous centre of mountains ; but, from the road between Nausherra and Ori, one can see on the other side of the river, towards the tops of the hills, immense masses of the white porphyry glaring in the sun through the underwood which covers these mountains ; and Captain H. Godwin-Austen, G. T. S., who assisted in the survey of this district, informed me that the white porphyry of the Buddhist ruin at Buniar forms the summits and all the central system of the Kaj Nag range. From a coloured sketch kindly made for me by this officer we are enabled to see that the porphyry forms the whole of the main chain of the Kaj Nag, a portion of the huge North-Western branch, and extends along the western or Mozufferabad branch towards Hazara. The rock passes gradually from the granitoid porphyry I have described to less and less crystallized rocks, until it becomes the pencillated white and blue felstone which we have seen at Baramoola, and finally the earthy, slate-like felstone of the Atala mount.*

The summit of the Sank or Sallar, on the left bank of the Jheelum, I have also painted as volcanic porphyry, from my observing that the valley of the Apaikey is strewn with blocks of porphyry to a

* Captain Austen described the felstone as a hard slate, but as he said that this slate was identical with the "hard slate of the lofty cliffs over the road near Nausherra," it is evident that what was taken for slate, was an earthy slate-like felstone. At the time Captain G. Austen observed these rocks, he had not yet begun to study geology.

considerable height, and disposed in such a manner that they cannot have been brought from any other locality but the summits above. When I visited the Apâikey valley, the summits on both sides were covered with a thick mantle of snow, but the very shape of the peak, a smoothly rounded boss, was suggestive of a hill composed of materials which wear quickly and round easily under the influence of atmospheric vicissitudes.

14.—We must now endeavour to ascertain the extent of country covered by volcanic rocks similar to those I have described, and I am again indebted to Captain H. G. Austen for the following information : “The so-called granite, or, as you say more properly, volcanic porphyry, of the Kaj Nag is quite unlike the granite of the Deosais or Ladak, which is pure granite or syenite. This Kaj Nag rock is seen again in the mountains bounding the south-east end of the valley (of Kashmir) and in Kistwar; and the whole length of the Chota Dhar range, bounding Badrawar to the south, is of it; I have seen it nowhere else. It is so strikingly peculiar that I should certainly have noticed it, had I come across it in other parts of Kashmir.”

How far the porphyry of Kistwar and Badrawar extends to the east, I have no means of judging;* but we have seen that the Kaj Nag extends towards the west into the upper part of Hazara; and I have had described to me some “granite” seen a few miles north of Mauserah, near the entrance into the Kaghan valley, which appears to be a volcanic porphyry similar to that which we have seen at Bupiar.† But it extends still further west: Dr. Costello informs me that a great deal of “granite” and quartz occurs in and near the Umbeyla pass, lately occupied by the troops under General Sir Neville

* The “granitic” belt between the Sutlej and the Kali rivers, long. 77° to $80^{\circ} 15'$, appears to be a continuation of the porphyry of Kaj Nag, Kistwar and Badrawar. In Sirmoor, Gahwal and Kumaon it forms the centres of mountainous systems such as Chor, Dudatoli, Binsar, &c. Capt. R. Strachey describes it as “often porphyritic and much subject to decay.” It passes into “mica-schist showing a distinctly laminated structure,” (felstone ?) and also into greenstone.

† Also “a place on the road (to Mausera) as it passes along the eastern edge of the Pukti valley gets its name of *Chitti wat* (white stone) from several large blocks and hillocks of white felspathic rock containing large crystals, the same as that of the blocks on the ridge of Buri a few miles to the S. W., and like them visible “from a great distance.”—*Journal of the Agricultural and Horticultural Society of India, Vol. XIV. Part I.*

Chamberlain. The General himself, in one of his dispatches, describes some of the hills as "granite," putting a note of interrogation after the word, and thus showing that the granitoid rock he noticed was sufficiently peculiar in its appearance to make it doubtful whether it was really a granite. From specimens of the mountains near the Pass, kindly given to me by Dr. Costello, I have no doubt that the so-called granite is one of the varieties of porphyry described in paragraph 12. It passes into a felstone composed of very elongated and large spindles of opaque, dirty white, and somewhat granular felspar and bluish semi-translucent glassy felspar, and in the spare felspathic paste which cements the spindles together, a few irregular grains are seen of a mineral having a metallic golden lustre, and which is probably Diallage or Bronzite. The rock has a great resemblance to, and is indeed identical with, the most compact sort of felstone seen at Baramoola. Bands of quartzite, of which I have seen very beautiful specimens as clear as Wenham lake ice, are also extensively developed, as well as enormous masses of compact gypsum and tabular selenite.

Dr. Bellew, in his "Report on the Yusufzaies," describes a variety of volcanic rocks occurring in the ranges which separate British Yusufzaie from Chumla, Buneyr and Swat: "Feldspar grit" and "various combinations of mica and felspar," "porphyry in a variety of forms," "trap-rock in great variety," quartz, mica and clay-slate, hornblende-rock, felspar-rock and amygdaloid; "hard trap" (greenstone?) "loose, friable and crumbling" ditto. (ash?) He also describes granite and gneiss; but he adds that the gneiss is quarried for mill-stones, and, if these mill-stones, (which is very likely) are similar to the mill-stones of Jellalabad, they are a coarse gneissoid felstone, and not a gneiss. The granite again is a whitish rock, and we find it connected with and surrounded by, rocks undoubtedly volcanic. I have no hesitation therefore in regarding it as a granitoid porphyry, similar to that of the Kaj Nag. A great deal of slate and "*primitive limestone*" is also mentioned in these mountains.

Dr. Bellew concludes that these hills are "all of primitive and metamorphic rocks;" but the list of rocks he gives, proves conclusively that they are of volcanic origin.

These volcanic beds in Yusufzaie are capped, in some places, by beds of

limestone, and these again by sandstone. No fossils have yet been discovered in either the limestone or the sandstone, and the age of these strata must therefore remain unknown for the present. Near Jellalabad beds of gneissoid felstone appear. This rock is quarried to make hand-mills which are brought down by the Povindahs and sold in Peshawur and the Derajat. These hand-mills are made of a coarse trachyte which has begun to effect a partial separation of minerals, and these minerals are arranged in streaks of white, granular felspar, greyish-blue felspar, with here and there a grain of augite. It is, therefore, again one of the varieties of felstone seen at Baramoola, and probably the same gneissoid variety quarried in Yusufzaie.

15.—By reference to the map we observe that the Pir Punjal chain is the first great parallel of the Himalaya, between the long. $73^{\circ} 30'$ and 76° E. It is a great chain, forming a belt of high mountains between the miocene districts of Jummoo, Rajaori, Poonch and Ori and the Kashmir valley, and at both ends of this great chain an immense accumulation of porphyries and other volcanic rocks, rising to tremendous heights, and covering some thousand square miles of country, are placed like two bastions at the extremities of a centric wall. What rocks then compose the connecting chain, the Pir Punjal? The reader will easily conceive how vexed I am that I was prevented visiting this range, more especially as the information I obtained from travellers is most conflicting and unsatisfactory. Mr. L. Drew, who has traversed the chain three or four times, was especially struck with the enormous development of a great slate bar of unknown age. We shall see in the next chapter, how very thick and extensive courses of slate are interstratified with beds of trachyte, ash and agglomerate, in the mountains bounding the Kashmir valley to the North. These slates are completely devoid of fossils, but as I hope to be able to fix the age of the volcanic rocks with which they are interbedded and contemporaneous, we had better reserve the discussion of their age until after the examination of the fossiliferous strata of Kashmir.

But the slates form only a band or bar in the Pir Punjal chain, and not the whole of it. I believe, that the remainder of the rocks of this range are mostly volcanic ash, felstone and agglomerates. A friend of mine and a very trustworthy observer, in the following passage

from a letter to me, is describing, I think, volcanic rocks, especially agglomerates and ash full of lapilli and volcanic conglomerates. "It (the lacustrine deposit of the valley of Kashmir) rests unconformably on trapean rocks, quartzite, quartz conglomerate, very hard and forming a compact mass." And again, further to the S. W. on the road through the Pir Punjal Pass, he says: "The rocks are principally mica-slate, with *thick beds of a hard conglomerate having a very fine dark blue matrix; this, in some places, was a mass of water-worn pebbles; but in most of it these are scattered through the mass, and are often in that case angular and small.* Up to the Pir Punjal Pass the dip is N. with a high angle; having crossed the ridge N. E. this continues all the way to Barangulla, giving these altered sandstones, slates and conglomerates an enormous thickness."* The excellent observer who wrote the above remarks did not think, it appears, that the rocks were mostly volcanic in origin, but I cannot help imagining that his description applies, in great part, to stratified ejecta of volcanic eruptions, and the passage I have put in Italics is, I think, a very fair description of ash with lapilli. Again, I must also remark that the felstone of Baramoola has always been described by travellers, and by geologists also, as mica-slate, though it contains no mica and is nearly wholly made of felspar; what has been taken for mica, being minute spindles of glassy albite. It certainly has a slaty cleavage, and the most earthy varieties have a close resemblance to metamorphic slate, and it is probably this fact which has misled most people as to the nature of the rock. It is not therefore impossible that some of the "mica-slate," mentioned above, is in reality earthy felstone.

16. The position of the Pir Punjal chain is rather peculiar, abutting as it does at both ends against enormous centres of volcanic rocks, and being separated by a great fault (the valley of Kashmir) from mountains also composed of the same rocks. In the enormous accumulation of amygdaloidal ash, agglomerate and conglomerate which we shall see, by and bye, on the other side of the valley, there is abundant proof of the existence of open volcanoes in this part of the Himalaya, at the time the porphyry was in a fluid or viscid state. The extreme

* I do not give the name of the person who kindly gave me the information quoted, as I do not agree with him on the origin of these rocks, and believe that he missed appreciating their true value, though his description is accurate.

regularity and evenness of the stratification of these cinder beds renders it highly probable that the showers of ejecta fell in a shallow sea in which the volcanoes formed islands. It appears to me, that we cannot refuse to admit that the porphyry was the base of the volcanoes, and indeed the matter which failed to escape through the vent in the earth's crust, whilst the felstone or clinkstone and varieties of trachytic rocks into which the porphyry always passes, are lavas which have flowed under the pressure of the sea. If these views are admitted, we have a series of volcanoes beginning at the Kaj Nag, and forming an arc along the north-east boundary of the valley of Kashmir, down again to the mountains of Badrawar: of this arc of volcanoes the Pir Punjal chain is the chord. Can we wonder, huge though the chain is, at its being in a great measure formed by ejecta of volcanoes received in a sea gulf and there arranged in conformable layers? The slate, as we shall see in the next chapter, was formed during the intervals of volcanic activity, and it is not improbable that the continual shower of ashes and hot stones into a shallow bay kept the water at a temperature too high for the development of animal or vegetable life.

Since writing the above paragraph, Capt. G. Austen has informed me that beds of unmistakably volcanic rocks, such as amgydaloid and coarse greenstone, are interbedded with the slate and other rocks of the Pir Punjal. This is precisely what occurs in the hills north of the valley of Kashmir, we may therefore regard the Pir Punjal as a mass of volcanic ejecta interbedded with slate which was deposited during the periods of volcanic tranquillity.

CHAPTER II.—*The Mountains North and North-East of Kashmir.*

17. By referring to the map, we observe that the Kashmir valley is an elongated trough with its longer axis directed S. E.—N. W. The Jheelum has a similar general direction, as far as the Woollar Lake, and the smaller stream which drains the north-western end of the valley flows from the N. W. to the S. E. To the north-east of this axis, we notice long spurs of hills which descend to the water-

edge of the Woolar Lake, the Manus Bal and the Dál and to the lacustrine plains of Pampur, Avantipoor, Bij-Behara and Islamabad. These spurs are the extreme south-western ends of a labyrinth of mountains which forms a barrier, nearly forty miles across as the crow flies, between the flat plain of the Kashmir valley and the chain of mountains which separates Kashmir proper from Drass, Sooroo and Ladak. If we consider the Himalaya as a series of parallel chains and valleys, we should have the Pir Punjal chain as one of the parallels; traversing the valley of Kashmir and the labyrinth of mountains to the north-east of it, we meet another great parallel chain, which has unfortunately no general name. It has been called by Col. Cunningham the Western Himalaya, but the name is evidently objectionable, as we want the term "Western," to designate the whole of the Himalaya between the longitudes east 73° and 79° , or between the Indus and the Sutlej. It has also been called the Central chain of the Himalaya by several authors, but the great quantity of snow which covers its peaks is merely the result of its being so placed, that it collects and condenses nearly all the remaining moisture contained in the south-western winds, and sends these winds perfectly dry to the Kailas and Karakoram ranges. The beautiful series of snowy summits presented by this chain is therefore no claim to its being the central chain of the Himalaya. I am afraid no other rule, but that of the division of drainage, can be considered safe in estimating which of the many parallel chains of a same system of mountains is the central one; and if we conform to this rule, the Karakoram range is to be regarded as the central chain of the Himalaya. It is therefore preferable to name the chain under consideration by the name of one of its great peaks, and as the Kun Nun or Ser and Mer Peaks (23,407 feet) are well known and very conspicuous in the western portion of the Himalaya, I shall make use of the term "Ser and Mer chain" to designate the great parallel range which separates the basin of the River Jheelum from that of the Indus.

Between the Pir Punjal and the Ser and Mer chains, we have not only the valley of Kashmir, but a number of independent and, as it were, isolated centres of mountains which, as I have said before, form a complicated labyrinth of hills and valleys to the north and north-

east of the Jheelum. If we travel, on the map, from the N. W. to the S. E. of the valley of Kashmir, following the banks of the Jheelum, we shall notice a series of mountains of moderate height, encroaching into the valley, and separated one from the other by broad lateral valleys more or less filled with lacustrine deposits. The first mountain we meet is on the eastern side of the Woolar lake, and is called the Safapoor (10,309). Its foot is bathed by a small but exquisitely picturesque lake, (Pl. 6) the Manus Bal. The next is close to Srinagar and is the Zebanwan (8813). Ten miles to the south-east, the Wastarwan, near Avantipoor, is the next summit; then, after crossing the valley of Trabal, we meet the hill of Kamlawan (8601), over the village of Murhama, and the Sheri Bal close to the Kamlawan. Crossing the broad valley of the Lidar River, we find the Hapatikri, a mountain which sends a spur to the S. W. to form the small hill of Islamabad at the foot of which the town of that name is built. Crossing the valley of the Arpat river, we meet with the Dhar (8146) and the Nawkan (9207). We have therefore, from the eastern shore of the Woolar lake to the extreme south-east of the Kashmir valley, a catenated chain of mountains composed of isolated summits, whilst their relations are covered by the diluvial and lacustrine deposits which fill the Kashmir valley, and the lateral valleys which open into it. This chain is therefore presented to us as a series of summits and not as a regular chain.* Its direction is that of the general parallelism of the Himalaya, viz. from N. W. to S. E. Ten miles, as the crow flies, to the northeast of this chain there is another similar one, that is to say a series of summits, apparently somewhat detached one from the other, but being in a line with the parallelism of the Himalaya. These mountains are from the S. E. to the N. W.—the Liwapatoor, the Wokalbul (14,310) the Girdwali (14,060), Batgool (14,423), Boorwaz (13,087), Handil (13,273) Saij Aha (11,334). West of the Saij Aha, this catenated

* I need hardly say that the catenated appearance of the chains described in the text is in great part due to erosion, and that this great erosion is only what was to be expected, if we remember that the whole rain-fall of the southern slope of the Ser and Mer chain has to find its way to the valley of Kashmir across these catenated chains, and that the Ser and Mer chains receive a tremendous snow-fall. I use the word "catenated," in the same sense as it is used in Anatomy, to designate the arrangement of the lymphatic glands of the neck, viz. like the beads of a necklace or rosary.

chain becomes blended with the first one I have indicated. Ten miles again to the north-east of the series of peaks just enumerated, is another chain of detached peaks or centres of mountains, arranged along a line parallel to the two others and to the general direction of the Himalaya. From the S. E. to the N. W. we have the following summits or centres of mountains: the Rajdain (15,389), the Gwasbrari (17,839) the Harbagwan (16,055), the Basmal (15,652), the Kotwul (14,271), the Haramook (16,903) and the numerous peaks which, with their complicated spurs, separate the valley of Kashmir from Gurais and Tillail.

Between all these catenated chains, connecting spurs or branches are to be seen spreading in all directions, and it is extremely difficult to give the direction of the resulting masses of mountains. But the geology of these mountains will help us a good deal to understand their topographical grouping. As we see these mountains on the map, we should be disposed to consider them as long spurs of the Mer and Ser chain descending towards the S. W.; but we shall see that all, or at least most of these summits, are composed in their centre of rocks which have once been in a fluid or viscid condition, that is of porphyry, greenstone, basalt and amygdaloid; that these melted rocks are covered by enormously thick layers of ash, agglomerate and slate interbedded, and that on the top of these beds of ejecta fossiliferous strata rest quite conformably. It becomes therefore evident, that the summits represent separate and isolated centres of volcanic action, no doubt much displaced by the last upheaval of the Himalaya, but yet preserving their relations to the beds of ejecta which were collected around their feet and on their slopes. We have therefore a linear arrangement of volcanoes, or at any rate of volcanic fused matter, (for some of the collections of melted minerals may not have reached the surface and never had a vent), this linear arrangement forming three parallel lines, and these lines being parallel to the general N. W.—S. E. direction of the Himalaya. I believe that similar lines of volcanoes or collections of volcanic matter are to be found between several of the great parallel chains of the Himalaya, but whether they are thus general or not, the ones in Kashmir are sufficient to prove that during the Palæozoic epoch, the volcanoes of the Himalaya had an arrangement more or less linear, and that the

great lines of fracture on which these volcanoes were situated, had the same direction as that of the Himalaya of our time.

18. Beginning with the southernmost line of summits, I will now describe in some detail the hills which compose it. I shall begin with that nearest to Srinagar, viz. the Zebanwan.

The Zebanwan is a mountain of 8813 feet at its highest point, with a general direction from E. to W. (Map B). Its eastern portion is nearly due E.—W., and is $2\frac{1}{4}$ miles in length. It then turns to the S. W., at the same time throwing out long spurs to the N. W. to embrace the eastern shore of the Dal. The Zebanwan keeps its N. E.—S. W. direction for $3\frac{1}{4}$ miles, when it bifurcates into two branches, a southern one, small and short, and a W. N. W. one, $2\frac{1}{2}$ miles long. It is at the end of this W. N. W. branch that the Tukt-i-Suliman rises, a very conspicuous little hill, seen from nearly every part of the valley. Still further to the W. N. W., $2\frac{1}{2}$ miles from the Tukt, the hillock of Hurri Parbut rises out of the lacustrine alluvial. It is evident that the Tukt-i-Suliman and the Hurri Parbut are only continuations of the W. N. W. spur of the Zebanwan, and appear as detached hillocks on account of the thickness of the lacustrine deposit. (Sect. A).

The following detailed section of Hurri Parbut, the Tukt-i-Suliman and the W. N. W. spur of the Zebanwan is at a right angle to the axis of these hills. It will give, I hope, a good idea of rocks which we shall meet again and again, and which I will, therefore, endeavour to describe now with some precision, as they are nowhere better seen or more conveniently studied.

Section of Hurri Parbut, Tukt-i-Suliman and W. N. W. spur of the Zebanwan. (Sections A, B, &c.).

Direction of chain: S. 65° E.—N. 65° W. General strike of beds S. E.—N. W. General dip of beds, north-easterly. The Section follows the direction of the range and consequently cuts the dip at an angle of about 65° instead of 90° . (See Sect: A). (Section II. of General Map). See also Map B.

Hurri Parbut. This hill is a succession of hard layers of trachy-dolerite and soft layers of other rocks. The trachy-dolerite is rough, compact, very hard and dark. I have never seen it scoriaceous. It is sparingly amygdaloidal, containing sometimes a few large geodes filled with white quartz. These beds are nearly vertical, with a dip east-north-easterly, forming with the horizon an angle seldom under 75° . The most westerly beds are nearly vertical, whilst the most easterly layers are more sloping. There are seven or



eight thick beds of this trachy-dolerite separated one from the other by the following rocks : (a) A slaty basalt, hard when fresh, but very soon falling into foliated debris. It reminds one somewhat of the earthy variety of the felstone of Baramoola. It is grey in colour. (b) an ash of a dirty-looking felspathic paste, full of rounded or oval nodules of dull augite or hornblende. These nodules are probably amygdaloidal in origin, being due to a bubbling of a hot paste of ash and water. It disintegrates very quickly into a yellow earth or a grey gritty soil on which grass grows well, soon concealing the rock below.

These beds of slaty basalt and ash are well stratified, and fill up all the spaces left between the layers of trachy-dolerite ; this last rock forms prominent ridges or saddles on which the several works of the fort are built.

A marshy alluvial plain intervenes between the Hurri Parbut and the Tukt-i-Suliman.

Tukt-i-Suliman. The western extremity of this hill (as it appears above the lacustrine deposit) is a little knoll which has received the name of Rustun Ghurree.

1. Rustun Gurree : Compact greenstone either greenish or bluish ; hard ; fracture conchoidal. Either no amygdala or a few large ones, about the size of a pigeon's egg, often irregularly shaped, composed of white opaque quartz arranged in concentric layers and never crystallized.* Strike S. E.—N. W. ; Dip N. E. = 50°. This is a hard rock and forms a prominent boss of a barren character. It is quarried for building purposes, but is too hard to be dressed, and as it breaks in angular pieces, it is altogether a very unsatisfactory building material. This bed has a thickness of about 60 ft.

2. A dirty yellowish-grey felspathic ash, full of geodes of dark augite. It decays fast, the nodules of augite, after partially decomposing and colouring the whole mass ochre-yellow, drop out of their niduses and leave a spongy mass of yellow earth somewhat resembling pumice, but not in its hardness. It is used as a good clay for pottery. It is much better developed on the northern than on the south-eastern side of the hill. In one section it is no more than 10 ft.

3. Resembling greenstone but much more amygdaloid. It is hardly seen on the southern aspect of the hill, where it is covered by vegetable earth and a cemetery ; but it is well seen on the lake side near the water gate,... 20 ft.

4. Tukt-i-Suliman : A mass of amygdaloidal greenstone, sometimes compact, as at the base of the Rustun Gurree, but more generally showing dark specks of augite or hornblende in the mass. The amygdala of white quartz invade it, either as large and scarce geodes disposed here and there

* These amygdala of white quartz occasionally fall out of their matrices and are to be seen in numbers, half-buried in the soft silty mud of the lake near the village of Drogehand. Should this mud one day dry up into a rock, a false amygdaloid will be produced, all the more difficult to distinguish from fused amygdaloid, as the mud of the lake is entirely formed of the debris of volcanic rocks.

irregularly in the rock, or as smaller geodes mixed among long cylindrical and twisted branches of quartz running through the mass. (See figs. 1, 1a. plat. X.) I must confess, I had some difficulty in understanding these branches; they look precisely like the arms of a canal or like small rhizomes, and they sometimes have the form of worm-burrows; they begin with thick branches or trunks about the size of the finger and throw out smaller twigs; they are often 6 or 8 inches long, and are cut obliquely by both stratification and cleavage. I have come to the conclusion, after examining a great many of these cylinders, that they are gas-vents, similar to the amygdala in origin, the imprisoned gas, in its efforts to reach the surface, having had sufficient strength to force a long passage through the viscid paste.* Dip 55° to 60° about 600 ft.

5. Amygdaloidal greenstone, graduating to trachyte; with innumerable small geodes, rounded and pressed together. The greenstone becomes rough and gritty and passes into a trachyte, it is much less amygdaloidal; and on the other hand, where the rock is excessively amygdaloidal, the paste is a dark brownish black rock, which is cleaved into well defined slabs, and breaks easily into prismatic fragments. This bed forms a depression between harder layers. The stratification is easily seen by the several courses of the rock superposed one on the other; but of course it is not seen in the thickness of each course. about 200 ft.

6. Pale bluish greenstone, hard, compact, with conchoidal fracture; it is closely spotted with irregular dots of hornblende. At the base of each compact layer, there is a margin 1 or $1\frac{1}{2}$ foot thick and very amygdaloidal, the geodes being filled with quartz. It is a very hard stratum ... about 150 ft.

7. Closely set amygdaloid. The paste is a greenish felspar, sometimes very compact and then dark, and cleaved into slabs half an inch thick; sometimes light in shade and with the amygdala rather irregular and nearly touching one another. In many specimens, the felspathic paste shows a division of the felspar into a bluish or greenish mass and patches of white felspar; but there is no crystallization. Dip 70° nearly due E. The felspathic paste decays pretty quickly and thus this bed forms a depression on the hill side..... 50 ft.

8. This is the stratum on which the celebrated Buddhist ruin is built; it is the highest summit of the Tukt-i-Suliman (6263 ft.) It is composed of very hard, dark greenstone, with amygdala of white quartz, occurring sparingly. Beds of lighter coloured greenstone, with specks and nodules of augite are interstratified. A great many well defined long cylinders of quartz, either white or black or smoky, such as I have described as gas vents, are seen here. This stratum is a hard saddle or ridge; nearly vertical, and dipping easterly. 60 ft.

* I have since read that Dr. MacCulloch observed in Little Cambay, one of the Western Islands of Scotland, amygdaloid containing elongated cavities similar, I believe, to those which are here described.

So far, the rocks have been purely igneous. We now meet an alternate succession of igneous rocks produced by the decomposition and arrangement under water of volcanic minerals. Ash, agglomerate and other strata of volcanic ejecta become also much more abundant.

9. A dark blue slate, in places clayey, in others calcareous, and effervescing slowly and feebly with acids. It decays soon and forms a depression. It contains no trace of organisms.... 15 ft.

10. A lumpy brown rock composed of a coarse felspathic paste which weathers chocolate-brown and contains a great number of lapilli, mostly black and basaltic-looking. It shows thin, lenticular beds of pale grey felspathic ash containing innumerable geodes, filled, some with quartz, some with dark augite (?) This stratum is not very hard, and rounds by weathering, so that it forms a smooth round boss and not a sharp saddle. It is about ... 30 ft.

11. This bed is interesting and presents a very peculiar appearance.

The rock is a pale grey trachyte in which crystals of dull white albite have imperfectly formed and arranged themselves in tufts of imperfect crystals forming more or less a star or section, (see fig. plate X.) When the rock is polished, (such as is seen in the pavement of Srinagar where it is polished by people walking over it*) the starry disposition of the crystals is evident enough, though in the fresh broken specimen it is rather confused. The rock is a passage between a trachyte and a felspathic porphyry. I have never seen or read a description of this variety of volcanic rock, and I therefore propose to call it "Soolimanite." On the north-western flank of the hill, this bed of Soolimanite is better seen than on the other side, and there presents some layers which show well the nature of the rock. Some of these layers, rather darker than those we have seen on the other side of the hill, contain the starry crystals well developed in the centre of the beds only, whilst above and below, that is near the lowest and uppermost parts of the beds, the

* The stone is not abundant, and very few pieces of it are seen in the pavement of Srinagar. I have seen two however, one in the vegetable market near the great Masjid, and the other between the first bridge and the gate of the Shere Ganie on the left bank of the Jheelum.

Fig. 4.

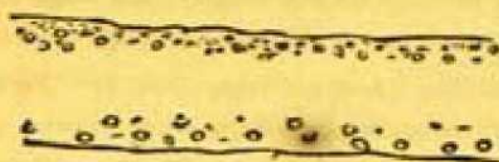
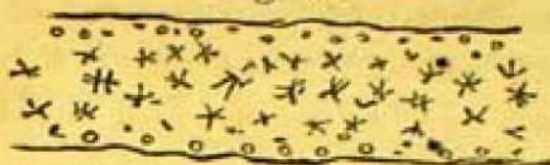


Fig. 5.

crystals disappear and are replaced by amygdala filled with quartz (fig. 4.) Other beds again of compact trachyte show neither starry crystals nor amygdala in their centres, but have their deepest layers invaded by large amygdala, and their uppermost portion full of small geodes, having besides a scoriaceous aspect (fig. 5).

In the middle of this bed of Soolimanite, some of the cylindrical tubes of quartz described before as gas-vents are well developed, branching in all directions through the rock.—Dip E. 70° about 30 feet.

12. Slate of various colours, laminated and very false-bedded, often squeezed and twisted. It has been folded, the lower part being nearly vertical with a dip westerly, whilst the upper part dips east 65° . The centre of the fold is much contorted and gathered in zig-zags, and in these contorted parts a great many gas-vents (branching cylinders of quartz) are well seen; some as large as the finger, others of the usual size, viz. a crow's quill. 200 ft.

13. A band of Soolimanite like 11. The slate of No. 12, has evidently been metamorphosed by the action of heat emitted by the band of Soolimanite which covers it. There must have been a considerable period of inaction between the two out-pours of Soolimanite to enable the slate to become collected, and it is evident that the slate was yet in the state of a silty mud at the time of the second eruption and was set bubbling by the heat of the Soolimanite.

I may here remark that I am satisfied that many of the layers of laterite, cellular slate and ash, which we shall see in this section, are nothing but true sedimentary deposits metamorphosed and rendered amygdaloidal by the bubbling or boiling of the waters which covered them. I had thought at one time, to try and distinguish the beds of ash and volcanic mud which were probably formed as I have just explained; but I found the work too uncertain and requiring too much time to be worth prosecuting. But no doubt can be entertained that, besides the slate and laterite, many of the beds of the mountains of Kashmir which appear to be volcanic ash or dust, are in reality metamorphosed sedimentary layers.

The Soolimanite has a thickness of 15 ft.

14. The band of Soolimanite gradually passes into a felspathic ash, often friable, but often also hard and compact and full of oval nodules of dark augite, varying in magnitude from the size of a pea to that of a pin's head. Occasionally the ash passes, along the strike, into a hard compact quartzite. The whole bed appears irregular and lenticular, and has been probably formed by ejecta falling into shallow pools of water 15 ft.

15. A calcareous rock which is not seen on the hill side, but gives out, on the brow of the hill, a good deal of nodular muddy carbonate of lime (kunkur). Here and there a brown ferruginous rotten ash (or metamorphosed calcareous shale?) crops through the grass on the top of the hill. It effervesces feebly with acid, and is probably the rock which gives out the kunkur. This layer, which is probably squeezed out of its place near the foot of the hill by the gradual curving of the strike of the harder rocks, is, at the top of the mount, at least 20 ft.

16. A thin band of amygdaloidal greenstone 12 ft.

17. Slate, grey. On the western side of the bed it dips W. N. W. 65° . In the centre it is much folded; on the eastern side it dips E. S. E. 75° . This angle, however, diminishing quickly to 65° 20 ft.

18. Greenstone alternately coarse and fine 20 ft.

19. Slaty basalt, dark bluish black, fracture conchoidal. It dips E. a few degrees S. 70° 30 ft.

20. A crumbling, brown, lumpy metamorphic mud, slightly amygdaloidal. It decays rapidly into a dirty yellow coarse gravel. It is interbedded with bands of agglomerate, the lapilli being mostly basalt 50 ft.

21. Sandstone, hard, rough, quartzose and micaceous; apparently much altered by heat. No organisms 3 ft.

22. Coarse quartzose grit, very hard and rough. It appears to be composed up of angular grains of quartz, variously coloured, cemented together by a siliceous paste. It may be a siliceous deposit in which crystallization of the purer quartz has begun to take place 15 ft.

23. Sandstone like 21. Dip. S. E. 10 ft.

24. Blue compact slate, becoming gradually first coarser and more like a shale, and then more silty or like yellow and grey clay-slate. The stratification is best seen by the coloured markings which indicate it to be only 25° and E. The bed has probably been squeezed out of its place 150 ft.

25. Coarse yellow sandstone with a calcareous cement. Cleavage well marked. No organisms 20 ft.

26. Slate, thin bedded and falling into angular fragments. It is mostly deep blue with bands or ribbands of yellow and grey. The dip is more regular than that of the slates seen before. It is nearly due E. with an angle of 40° 200 ft.

27. Slate, fissile. It differs from the preceding by decaying much more quickly by exposure, the whole bed being covered by small *débris*. It dips W. on its western side, and E. on the eastern, whilst the centre of the fold is zigzagged 30 ft.

28. Slate, compact and dark blue 8 ft.

29. Slaty shale, grey and dark, dipping W. a few degrees N. at an angle of 55° . It is continued (underneath) by coarser shales which form an anticlinal (not easily seen on account of *débris* and of the decayed state of the shale). On the other side of the anticlinal the dip is nearly due E. 60° . The extent of outcrops of this layer (not its thickness) is about..... 5 to 600 ft.

30. Metamorphosed slate, fissile and greyish blue; much jointed; the joints are yawning, sometimes a foot apart; they strike W. E. vertically. The stratification dips E. S. E. with an angle of 50° , but that is much falsified by the stratum inwrapping the end of the spur. This bed presents in its middle, thin layers as follows:

a. Soft, yellow quartzose sandstone, nearly friable, 8 inches. b. Dirty quartzite, 8 inches. bb. Do. with veins of pure white opaque quartz, 1 foot. c. A hard, brown, baked quartzose with spreading veins of quartz, 6 inches. Total 3 feet. The whole outcrop of the bed (not its thickness) is about 130 ft.

Here ends the Tukt-i-Suliman, and between this hill and the foot of the W. N. W. spur of the Zebanwan passes the road from Srinagar to the Nishat Bagh. (Sect. A).

The W. N. W. Spur of the Zebanwan. Ascending this spur in the continuation of the section, we have the following beds:—

1. Slate more or less laminated, with large yawning joints striking W—E. The stratification is well shown by the colouring of the slate, it dips W. 45° ; inwrapping the end of the spur.

It may be here remarked, that the beds of slate, ash and fossiliferous rocks nearly always present this inwrapping arrangement at the end of spurs and when they cross a spur; it appears that these beds had plasticity enough to bend all round when upheaved by inferior rocks. A fine example of this inwrapping arrangement is seen in the limestone which terminates the spur of the Zebanwan over the village of Zeeawan: the limestone, in endeavouring to arrange itself around the band of volcanic rock which upheaved it, has split into slices from 5 to 15 feet thick, diverging like an open fan. (Sect. C).

To come back to our section, the slate has a tendency to break into prismatic pieces, and the joint-surfaces are coated with a yellowish or

dirty white quartz. This bed is evidently a continuation of the last bed of the Tukt-i-Suliman (30 of section A), and the road passes over a synclinal, which would be very evident, were it not for the inwrapping arrangement of the slate at both extremities of the bed. As we go up the hill, we observe that the bed forms a small eminence of its own, being separated by a fault from the western beds which have a general south-easterly dip. It extends for about a thousand yards along the southern aspect of the hill, wheeling round and, as it were, lining the foot of the spur, its dip becoming gradually more southerly until it is S. W.

2. Following our section, we find, after the fault, the same alternate disposition of felspathic ash with nodules of augite, of dark slate more or less laminated, baked and metamorphosed, and of volcanic agglomerate full of dark coloured lapilli. It would be tedious and unprofitable to give a minute description of each bed, especially as the enumeration would be a long one, each bed being seldom more than 10 feet in thickness. No greenstone was seen for more than half a mile; the ashes are always tolerably compact when not in a decomposed state, and always invaded by innumerable nodules of augite. They are always well stratified, and it appears therefore evident that the whole of the ejecta fell into water, by which they were arranged in well defined strata. The amygdaloidal condition of nearly all the rocks, whether ash or slate, seems to indicate that the water was raised to a high temperature during the volcanic eruptions; and the want of animal remains in the slate beds and amongst the agglomerates is in accordance with this hypothesis.

It goes on, as I said before, for above half a mile, alternating ash and slate, with occasionally a dirty-brownish bed of rotten and calcareous ash decomposing very fast and throwing out, on its surface and also between its joints, a large quantity of kunkur. The strike of the beds turns gradually to true N. S. and the dip is E., the angle with the horizon being between 60° and 70° . Beds of laterite now begin to appear, of a yellowish grey colour and resembling indurated clay. They are a little harder than slate, sparingly amygdaloidal, and the geodes are very small and filled with quartz. They break into small cuboid fragments. These laterites are interstratified with beds of dark slate, and lying over them we get the following strata:—

x. A band of greenish-grey trachyte with small rounded geodes of chalk-white albite. It weathers somewhat reddish on its outside and wears in rounded masses. It reminds one very much of some of the felstone of Bara-moola. Strike N. 15° W.—S. 15° E. Dip Easterly 40° . But this stratum varies very much along its strike, becoming in places a ferruginous, rotten, augitic amygdaloid; in others a sandstone made of big rounded grains of quartz, of hornblende and of other volcanic minerals, with a calcareous cement which effervesces powerfully with acids. This sandstone forms slabs 1 to $1\frac{1}{2}$ inch thick, and superposed one over the other like bricks in a wall. Again a little farther on, it is a fine, very compact, smooth laterite, passing gradually into a more sandy variety containing very minute spangles of white mica hardly visible in the day time, but which shine well by candle light, and also a few small rounded nodules of a pale green semi-lucent mineral. The variations of this bed along the strike seem to indicate a very shallow shelving shore or a pool of water, the bottom of which had been frequently disturbed by the appearance of lavas or other heated matter. The bed is about 15 feet thick at the outcrop.

xi. Then the slate, blue and compact, comes again, with occasional thin beds of sandstone or dark-stone: a coarse grained highly ferruginous amygdaloid, a sort of peperino, forms a bed 15 feet thick, and on the top of this, here and there, are patches of grey laterite. The slate and the sandstone alternate repeatedly in beds of more than five feet each, and this goes on for a thickness of about 160 feet.

xii. A ridge of coarse, brown, slightly micaceous sandstone, in superposed slabs like a built wall, now makes its appearance. It strikes S. W.—N. E. and dips easterly 45° . This strike S. W.—N. E., meeting the strike of the preceding layers x and xi which is N. 15° W.—S. 15° E., leaves an open angle or yawning on the northern flank of the hill, and this is filled up by laminated slate, much broken and of various colours, a good deal of it being yellow. It is the yielding of this soft slate which has allowed the hard and unyielding sandstone to take a direction to the S. W. instead of to the S.

The thickness of this sandstone ridge is about 45 feet, and that of the slate, which fills up the gap or yawning on the flank of the hill, about 40 feet.

xiii. Slate, hard but much cleaved; about 80 feet.

xiv. A ridge of very compact and massive baked clay, having a conchoidal fracture and large distant joints. It is yellowish grey in colour, with bands of lighter yellow: one would take it for a light-coloured basalt, if it were not for its trifling hardness, which is about that of slate. It appears to be a clay made up of silty mud, derived from basaltic and other volcanic rocks and baked after formation. Perhaps it would be best named "Massive Laterite." The joints and the surface are covered with a rich brown iridescent oxide of iron or a black crust of the same material. This rock is nearly vertical, and is near a fault of considerable extent which cuts the hill right across,

and this proximity to a large fault might perhaps account for the metamorphosed appearance of the clay.

FAULT.

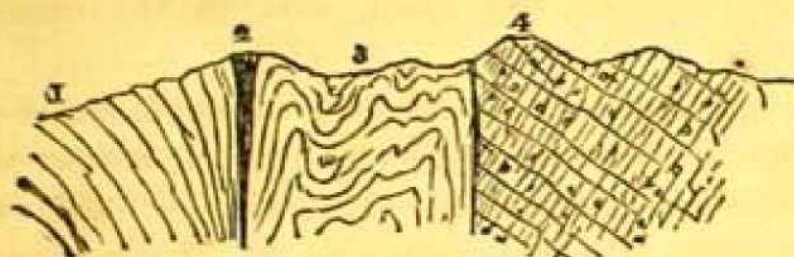


Fig. 6.

1. Slate.
2. Massive Laterite or Baked Clay.
3. Slate, Ash and Laterite in the fault.
4. Amygdaloidal Greenstone.

East of the fault, the rocks are very different; they are rocks similar to those we saw at the foot of the Tukt-i-Suliman; viz. greenstone and amygdaloid, and there has been therefore a downthrow on the west of the fault. The strike is very different on both sides of the fault. We have seen that on the west side it is S. W.—N. E. with an eastern dip; the greenstone and amygdaloid strike S. E.—N. W., dipping to the N. E.

There is no occasion to describe these greenstones and amygdaloids again, as I have done so before at the foot of the Tukt-i-Suliman. But we must notice here a very great quantity of what I have called gas-vents; the amygdaloidal greenstone is in some places completely perforated by these vents which are sometimes filled with quartz, sometimes with augite, and sometimes left empty. (See figs. 1. 1a, Pl. X.)

20. Crossing the broad ravine above the village of Pandrettan, a ravine in which once flourished a Buddhist city of which the ruined walls are still to be traced, we notice a spur composed of dark and brittle basalt, much jointed but not columnar. It is interstratified with a volcanic ash, similar to that seen in the Rustun Gurree. The end of the spur presents a fine example of beds of ash and laterite inwrapping or infolding subjacent beds: the spur is narrow and the layers of ash and laterite are bent down on each side of it, just as a layer of paste laid across a ruler would by its weight bend on each side of the ruler. The dip of the beds is N. E., and consequently the strike is obliquely across the spur which has a W. south-western direction, and when we look up the hill, facing to the N. E., we can then see the beds of ash and laterite cropping out one above the other, like steps,

The fault is about 500 feet wide, and is filled with zig-zagged slate, ash and laterite. A very great deal of kunkur is found all over the ground. This fault goes right across the hill, from near the ruin of Pari Mahal to the small spur over the village of Pandrettan.

and forming arches along the strike. This curvature of course falsifies the dip on both flanks of the hill, the dip becoming northern on the south eastern flank of the spur, and south east on the other flank.

The lowest portion of the spur forms a little mound on which may be seen the remains of a gigantic Buddhist figure. The figure is that of a woman, but it is now prostrate and headless. It is a huge block of limestone. There are many other Buddhist remains at Pandrettan, all built of that rock: amongst others, a small temple in a tank is well worthy of a visit.

From Pandrettan to Panchhooka, we have a succession of thick beds of dark basalt, cleaved and jointed but never columnar, and greenstone and amygdaloid, with a few beds of compact ash containing oval nodules of augite. The basalt is the only rock which has not been described before. It is best seen in a little spur which descends to the Jheelum, hardly half a mile east of the Buddhist figure on the little knoll. It has sometimes a very black and conchoidal fracture, and at other times a pale pitch and bluish colour. It breaks into prismatic blocks which are quarried at the place where the spur hangs over the river. It does not appear to be amygdaloidal, but the greenstone into which it passes is sparingly so, the geodes being large and filled with quartz. It is difficult to ascertain the stratification or superposition, owing to the well marked cleavages and joints, but by observing the beds of compact ash occasionally met with, it is found to be easterly at a very high angle with the horizon. All the way from the stone quarry, at Alwajin, to that portion of the village of Panchhooka, designated on the map as "Large Cheenar Trees," there is a succession of these beds, but the angle of dip diminishes gradually as we travel eastwards and is only 45° at Panchhooka. There we find the following beds:—

A slaty basalt, dark and heavy, dipping to the E. a few degrees S. at an angle of 45° with the horizon. It has a cleavage dipping due W. with an angle of 45° , and vertical joints striking S. W.—N. E. It is succeeded by a coarse trap, a sort of trachyte showing a certain amount of crystallization, the rock having a granitoid or rather gneissoid appearance. The augite and the glassy felspar are the only minerals tolerably crystalline, the remainder being a paste which is sometimes nearly white, or yellow and rough; sometimes greenish-grey and conchoidal in fracture, or blue, indigo-blue and

French grey. There is much in these strata to remind one of the starry trachyte or Soolimanite of the Tukt-i-Suliman, but the starry arrangement of elongated crystals of albite is never perfectly seen.

A layer of amygdaloid covers in the trachyte.

From Pandrettan to Panchhooka, we have been examining the beds of the southern spur of the Zebanwan. The W. N. W. spur may be considered to end or rather to begin over Pandrettan, and from thence eastwards we cross the digitations of the southern spur. A glance at the horizontal section (Map B) will render any further explanation unnecessary.

Here ends our section through Hurri Parbut, the Tukt-i-Suliman and the W. N. W. portion of the Zebanwan.

21. We will now examine the south-south-eastern flank of the Zebanwan, following a section from near Panchhooka towards the E. N. E. (See Map B.) (Section III. of General Map or Map A.)

We meet first a long slender spur proceeding from the main range of the Zebanwan to the S. S. E., and as this spur is very interesting, I have called it the Zeeawan spur from the name of a village situated close to its extremity. (Sect. A, B and C.)

The Zeeawan spur is composed, high up the hill, of the same basalt, amygdaloid and greenstone which we have seen in the preceding spur, but towards its end it is made up of enormously thick beds of volcanic agglomerate. This agglomerate is composed of a cement having the shining appearance of a slag, but not in its vesicular arrangement. It contains lapilli of nearly all the rocks which we have seen before, viz. greenstone, basalt, amygdaloid, slate of various sorts, and pieces of both felspathic and augitic ash. These lapilli are quite angular and crammed together so close that in some places the cement can hardly be seen. This cement appears to have at first coated the fragments with a thin layer of a dark shining paste, and then glued them together with a coarser material; or it is very possible that this coating is a superficial melting of the lapilli, and that the cement is a lava. However this may be, this agglomerate forms the greater portion of the spur. A confused stratification is discernible, dipping to the E. S. E. at a higher angle, and cut at right angles by well marked joints; thus huge blocks are separated from the mass and

strew the ground at the foot of the spur. Towards its end, the spur bifurcates into two digitations, the most westerly being entirely made up of agglomerate, whilst the most easterly presents the following section :—

Section of the end of the Zeeawan spur above the village of Zee-awan. (See Sections B. and C.)

1. Volcanic agglomerate with a shining, dark, semi-vitreous cement. It is interstratified with bands of amygdaloid and thin layers of peperino. 15 ft.
2. Quartzite, white, opaque, stratified; it breaks into cuboid fragments, owing to numerous well-marked joints. It is sometimes yellowish, but usually quite white. It is a conspicuous layer and deserves to be remembered, as it always occurs between the volcanic rocks and the beds of limestone to be hereafter described.* 15 ft.
3. Compact basalt, of a dark colour and breaking in prismatic pieces. It is often scoriaceous on the surface of layers..... 20 ft.
4. Compact amygdaloidal greenstone. 3 ft.
5. Greyish-blue basalt; heavy; much fissured. 5 ft.
6. Coarse yellow sand, with numerous water-worn pebbles of the basalt No. 5 imbedded in the sand. The pebbles are lenticular in shape, such as are seen on the shores of lakes and sluggish rivers, and unlike those rounded by torrents. 6 ft.
7. Sandstone, grey and bluish, but weathering to a fawn-colour. It contains a few water-worn pebbles similar to those seen in the preceding layer. 3 ft.
8. Slate, greyish-blue; fissured and foliated. 5 ft.
9. Sandstone of rolled grains of quartz. 3 ft.
10. Slate, as before. 3 ft.
11. Compact and dark rock, much jointed and breaking in flat square pieces. Either a baked clay or a laterite. It is all broken to pieces on the surface of the bed. 5 ft.
12. A conglomerate of water-worn pebbles of trap united by a calcareous cement. The pebbles are not lenticular, but rounded..... 2 ft.
13. Dark shales containing débris of fossils not determinable. ... 10 ft.
14. Limestone; dark greyish-blue; coarsely crystalline; in places very impure, argillaceous and shaly. It is a mass of fossils. 5 ft.

* Having now reached the fossiliferous strata, I shall not, in charity to the reader, give the section of the spurs of the Tukt-i-Suliman and Zebanwan which face the little lake or *Dal*. But the map (see Map B) will enable any one wishing to know the geology of these spurs, to satisfy his curiosity. I have indeed to apologize for the minuteness of the section of the Tukt-i-Suliman, &c. But in a country new to the geologist, a section, I think, cannot be too minutely detailed.

15. Dark brown calcareo-ferruginous shales, exfoliating in thin plates and undergoing quick decay. It weathers nearly black. Extremely rich in fossils. 10 ft.
16. Limestone. 10 ft.
17. Dark brown calcareo-ferruginous shale..... 15 ft.
18. Limestone. 10 ft.
19. Sandy shales, very dark nearly black; do not effervesce with acids; very rich in fossils. 10 ft.
20. Limestone; less coarse than preceding; very fossiliferous. . 15 ft.
21. Limestone; hard and arenaceous; separated by thin layers of shale which weather dark brown and appear in relief on the section of the bed.... 5 ft.

Any further bed which may exist is concealed under Eboulis.

22. When I first met with this bed of limestone, I was particularly delighted, as I had seen no limestone in Kashmir, except the huge carved blocks of the Buddhist ruins near Srinagar and at Pandrettan. I was told that the fine bluish-grey limestone of these ruins was no longer to be found in the country, and that nobody could guess whence the stone had been obtained. Even some of the Surveyors of the Kashmir Series, G. T. S. corroborated this opinion, which appears to be the received one amongst the natives. I could see at a glance that here I had the very stone, and in examining the bed I came across the remains of an old quarry. I subsequently found some much larger Buddhist quarries of limestone, as we shall see by and bye.

Misled by Mr. Vigne and Dr. A. Fleming, who, as I have said, stated that they obtained nummulites from the Kashmir valley, I began to look diligently for these foraminifers. I found indeed a few rounded bodies which might be taken either for nummulites or rings of crinoid stems. I did not at first hit on a very good portion of the bed for fossils; those I found were extremely weathered, and I could only pay flying visits to Zeeawan. But I tried once more to discover nummulites, when lo! I came across a *Productus*! The following genera were found to be abundant: *Productus*, *Athyris*, *Orthis*, *Strophomena* or *Leptaena*, and *Spirifers* amongst the Brachiopods. Very few lamellibranchiates and gasteropods were seen, but an immense number of Bryozoa, especially two or three genera of *Fenestellides*—viz. *Acanthocladia* and *Fenestella* and

innumerable individuals of what has been called *Vincularia multangularis* (Portlock), but which some say is not a *Vincularia* at all. Some of the fossils are familiar to every body: the *Productus semi-reticulatus* (Martin), *P. costatus* (Sow.), the *Athyris Roissyi* (L'Eveillé). Other fossils are interesting on account of their rarity, and first amongst these is the claw of a crustacean, the pincers of which are two and a half inches in length. Though the pincers are neither toothed internally nor flattened into organs of natation, we may, I think, refer the fossil provisionally to the genus *Eurypterus*, if it is not even a true *Limulus*. (See Pl. V. fig. 4.)

23. We have therefore, resting on the volcanic rocks, beds of carboniferous limestone. These beds are of great thickness, and they change their characters very considerably as we follow them upwards. I have divided them into three great divisions, and I have called these by the names of the localities where they were found to be well developed. The lowest bed, which we have just seen, I have called the Zeeawan bed, from the village of Zeeawan. The next above will be called the Weean bed, from the village of Weean near which it is well developed; and the uppermost division I have named the Kothair bed,* from the name of a small district at the foot of the mountains where this upper bed is well seen. I have preferred adopting these names to the plan of using the designations of Lower, Middle and Upper, as further observations may render it desirable to sub-divide any division into two or more sections, in which case the terms lower, middle and upper would become inconvenient. In the present state of our knowledge of the geology of Kashmir and the N. W. Punjab, we may nevertheless remember with advantage, that the Zeeawan is the lowest, the Weean the middle, and the Kothair the upper bed of the mountain limestone.

24. To come back to our section near Zeeawan: we must first notice the inwrapping disposition of the beds around the end of the spur. The general strike of the volcanic rocks is N. N. E.—S. S. W.

* So few fossils were found in the Kothair bed, that it is not possible to place it, with any certainty, in the carboniferous; the same reason prevents its being placed in the Permian or Triassic. The place of this bed as the uppermost carboniferous is therefore only temporary. See the remark after the list of fossils found in the Kothair bed, Chapter II., para. 50.

and the dip E. S. E. High up the spur, this dip forms a considerable angle with the horizon, but it diminishes gradually as we descend towards the plain; at the bed of quartzite* it is about 45° , and at the limestone it is generally 40° . But these rocks, that is from the quartzite upwards, appear to have been upheaved by a narrow band of hard rock catching them in the centre and pressing them upwards in that central point, whilst the sides of the beds were unsupported. Instead of yielding softly and shaping themselves into a carapace-like coating, as slate and ash would have done, the limestone and the shales have separated into thick bands or slices, and these bands have spread themselves out like a fan. At the small end of the fan there has been a considerable crushing of the beds one against the other, and enormous blocks, indeed whole pieces, of the limestone courses have been squeezed out of place; whilst, at the circumference of the fan, the beds have been parted from one another, and in some places we can see the layers of limestone separated by open intervals two or three feet wide. (See horizontal section, Sec. C.)

25. I will now try to define the character of the Zeeawan bed of carboniferous limestone:—Its lithological characters are, that it is a rough, coarse and semicrystalline limestone of a dark bluish-grey colour, weathering a rich grey. If we break it, we find it made of innumerable irregular grains of a darker limestone united by a lighter cement more or less crystalline. It is full of debris of fossils; indeed I am not quite sure that the darker grains are not the debris of the organisms or excrements of animals. It is foetid. Portions of it are arenaceous or rather shaly, and these, when exposed to the air, decompose partially, becoming soft and crumbling. The stone is soft to work and cuts with great ease, except where there are too many large fossils. It contains an immense number of minute crinoid-stems converted into spar: it breaks obliquely to the surface and gives flashes of light at certain angles. It is interstratified with courses of rich-brown calcareous shale, often of a bright rust-colour, and generally much decomposed and with bands of a black, not calcareous, sandy shale: it is also full of fossils, these being apparently converted into oxide of iron. Finally, it contains limited short, lenticular layers of a much paler limestone, in thin-bedded and false-bedded patches having somewhat the appearance of a fine mortar or cement.

The characteristic fossils of the bed are the following:—

Productus Costatus (Sowerby).

„ *Semireticulatus* (Martin).

„ *Cora* (D'Orbigny).

„ *Humboldtii* (D'Orbigny).

„ { *Flemingii* (D'Orbigny).

„ { *Longispinus* (Verneuil).

Athyris, Sp. ——— Pl. II. fig. 1 & 1a. *A. Subtilita* (Hall)?

„ *Roissyi*? (Verneuil) Pl. II. fig. 3 & 3a.

„ Sp. *Nora* (A. Buddista, Verchère) Pl. II. 2, 2a 2b.

Spirifer (Sp. *Verchèrii* (Verneuil) Pl. I. fig. 1, 1a & 1b.

Spiriferina octoplicata? ——— Sowerby, Pl. I. fig. 2, &c.

Orthis Crenistria, Phill. ———

Strophomena Analoga, Phill.? Pl. II. fig. 4.

Fenestella Sykesii (Koninck).

„ *Megastoma* (Koninck).

„ Sp. ——— Pl. V. fig. 1.

Vincularia Multangularis (Portl.)

Acanthocladia, Sp. ——— Pl. V. fig. 4.

We shall have therefore no difficulty in identifying this bed wherever we meet it, as the Bryozoa make a great show and immediately attract attention. The coarse granular limestone is unlike that of the other beds we shall see hereafter; the rich brown shales are also peculiar to the Zeeawan bed, and even the position close over the glaring white quartzite would assist us, if necessary.



Contributions to Indian Malacology, No. VII. List of species of Unio and Anodonta described as occurring in India, Ceylon and Burma.—By WILLIAM T. BLANFORD, A. R. S. M., F. G. S.

[Received 5th September, 1866.]

There are few genera in the whole range of natural history more puzzling than *Unio* and *Anodonta*. Every naturalist who has attended to them has been struck by the great variation of which the different species are susceptible, though it is to be regretted that this knowledge does not appear to have had much influence in restraining some naturalists from recording as distinct species isolated specimens which reached them from distant countries, and which only differed from other specimens in characters of very doubtful specific value.

Although the *Unionidæ* of the Indian waters are far behind those of some countries, and especially of America, in the amount of variation which they exhibit, amply sufficient is shewn to render them very difficult to classify. And as the question of variation is one of the most important, especially at the present day, in the whole range of zoological science, those animals which, in the wild state, exhibit the greatest amount of variation, are peculiarly worthy of study.

In endeavouring to classify the Indian shells, one great difficulty that I have found, has been the determination of described types. Descriptions of Indian *Unionidæ* are scattered through many works, not easily procurable in India. There are, probably, yet a few to which I have not had access, but as I have been able to compile a list, comprising, I believe, a very large majority of the published forms, I think that I shall be aiding any one who, in India, may be engaged in the same study, by printing the list, with references to the original descriptions and to figures, whenever such exist, and by adding such remarks as appear to be necessary.

I also hope to be able to publish figures of a considerable proportion of the species named; in some cases, copies of the original illustrations; in others, drawings of authentic specimens. I shall feel greatly indebted to any one who will aid me in this endeavour by furnishing me with typical forms, or with any specimens from distant parts of the country. In all such cases, a small series of the varieties and different ages is desirable.

The present list, therefore, is merely an instalment of what I hope may be an illustrated monograph of Indian *Unionidæ*.

It is not my intention at present to enter at all fully into the question of the limitation of specific forms. I would merely point out, that some of the described species are certainly within the ordinary limits of variation of others described as distinct. Thus out of one tank in Calcutta, I have taken specimens unquestionably belonging to *U. Corrianus*, Lea, others which were nearer to *U. lamellatus*, Lea, and young specimens representing *U. bilineatus*, Lea, whilst other forms again appeared to appertain to *U. anodontina*, Lam., (or, at least to the species figured as such in Küster's monograph) which by Lea is classed as a variety of *U. marginalis*, Lam. Yet all these forms were unquestionably identical, being united by numerous intermediate varieties, all living together in the same small pond.

Lea's figures in the Journal of the American Philosophical Society, and the Transactions of the Academy of Natural Sciences of Philadelphia, are so good and characteristic, that the difficulties which might otherwise exist in identifying forms discriminated by such minute and variable characters are obviated. Benson's species, of which only descriptions exist, are far more difficult to identify, and Gould's, which are but briefly described, still more so. Küster's monograph, in Martini and Chemnitz's Conchylien Cabinet, contains figures of but few Indian and Burmese Unios, and of those, several are incorrectly named.

For convenience sake, the species of *Unio* inhabiting India proper, Ceylon, Assam, and Burma will be separately enumerated. The species referred to *Anodonta* are so few that subdivision is unnecessary, especially as none occur in India or Ceylon. No typical form of the genus is known to exist in the Indian or Burmese area.

The following works are referred to in the ensuing pages by the abbreviations appended in each case.

Müll.—O. F. Müller, Historia Vermium, 1774 (not procurable in Calcutta).

Chemn. Conch. Cab.—Martini and Chemnitz systematisches Conchylien Cabinet. About 1780? (not procurable in Calcutta).

Gmel.—Caroli a Linne Systemata naturæ. Tom. I, Pars. VI, 1789.

Lam.—Lamarck, Histoire des Animaux sans vertebres, Vol. VI. 1819.



Gleanings in Science, Vol. I., Calcutta, 1829.

Küster, Mart. and Chem.—Systematisches Conchylien Cabinet von Martini und Chemnitz, 2nd edition, by Dr. H. C. Küster and others. Vol. IX. Part 2, commencing in 1843; unfinished.

Ann. and Mag. Nat. Hist.—The Annals and Magazine of Natural History, London, 3rd series, Vol. X. 1862.

Trans. Am. Phil. Soc.—Transactions of the American Philosophical Society held at Philadelphia, new series, Vol. IV. 1834; Vol. V. 1837; Vol. VI. 1839; Vol. VIII. 1843.

Jour. Acad. Nat. Sci. Phil.—Journal of the Academy of Natural Sciences of Philadelphia, Vol. IV. 1858-60; Vol. V. 1862-63.

J. A. S. B.—Journal of the Asiatic Society of Bengal, Vol. III. 1834; Vol. IV. 1835; Vol. V. 1836.

Proc. Bost. Soc. Nat. Hist.—Proceedings of the Boston Society of Natural History, Vol. I. 1843-44, (not accessible in Calcutta).

Gould, Ot. Conch.—Augustus A. Gould, Otia Conchologica, descriptions of shells and mollusks from 1839 to 1862, Boston, 1862.

S. Hanley, Supp. to Wood's Ind. Test.—Supplement to Wood's Index testaceologicus, 1855 (not accessible in Calcutta).

Genus UNIO, Retzius.

I.—INDIA.

No. 1.—UNIO CORRUGATUS, Müll. sp. Rivers of Coromandel.

Mya corrugata, Müll., p. 214, No. 398.

Unio corrugata, [a.] Lam., VI., 78, No. 34.

U. corrugatus, Küster, Mart. and Chem., p. 289, pl. 97, figs. 3, 4.

There is the greatest conceivable confusion about this species and the next one, and it is far from clear what Müller's type was. I cannot obtain access to his work in Calcutta, but Küster copies the description thus :—

Testa rhombea, viridescens, tenera, pellucida; (umbonibus corrugatis;) valvulae intus striis radiantibus subtilissimis notantur.

The figures are, I suppose, those of Chemnitz's types; they are two in number, one representing the exterior of a subequilateral, nearly elliptical shell, measuring 36 mm. by 24 in its two diameters, and the other the interior of a far more inequilateral shell, also subelliptical, rather smaller than the first, and having every appearance of being a

thick form, with strong lateral teeth. The first shell is subalate posteriorly, and the posterior margin is very bluntly biangulate, the anterior margin is rounded at the end, but the slope thence to the umbo is almost a right line; the second shell is perfectly rounded both before and behind. The shell of which the interior is figured corresponds so ill with Müller's description, being neither rhombic nor thin, that it may certainly be neglected. The figure moreover is ill-executed.

Lamarek's description is a little different from Müller's: "*Unio testâ ovato-rhombeâ, tenui, viridi, umbonibus rugosis, rugis undulato-flexuosis sublongitudinalibus*. Of the variety *a* he adds *testa viridis, pubis carinâ lævigatâ*. His variety *b* is said to be the next species, *U. rugosus*.

The type shell in Mons. de la Serre's cabinet in Paris, which, by the politeness of M. Chenu, the Curator, I was enabled to examine in 1862, is a thin broadly ovate form with small teeth, and a well marked posterior wing. It measures 40 mm. from anterior to posterior margin, and 33 from the umbo to the ventral margin, the latter diameter being thus much greater in proportion to the former than in Küster's type. The valves are inequilateral and much broader behind than before, the anterior margin rounded, sloping away below to the ventral side; posterior margin bluntly biangulate, the two angles rather wide apart. The form is common in Southern India and Ceylon, and appears to have been generally accepted as the type.

Both Lamarek's and Chemnitz's types are quite distinct from Benson's *U. favidens*, which has been confounded with them.

No. 2.—*Unio rugosus*, Gmelin. Rivers of Coromandel.

Mya corrugata magna, Chemn. Conch. Cab. X. 346, Pl. 170, f. 1659.

M. rugosa, Gmel. p. 3222, No. 32.

Unio corrugata, [b.], Lam. VI., 78, No. 34.

Unio rugosus, Küster, Mart. and Chem. p. 290, Pl. 97, f. 5.

Both this and the preceding species probably inhabit the Cauvery or neighbouring streams. Küster's figure represents an elliptical sub-equilateral shell, with strong angulate sulcation at the umbones, extending to within no great distance of the ventral margin. Gmelin's original description is the following:—



M. testâ ovali rugosâ, extrinsecus virescente, intus margaritaceâ : cardinis dente primario crenulato, laterali longitudinali, alterius duplicato.

No. 3.—UNIO MARGINALIS, Lam. Bengal. •

Lam. VI. 79, No. 41.

Küster, Mart. and Chem. p. 239, Pl. 80, f. 4.

This species is probably the most widely distributed of all the Indian forms. It is extremely variable, and I am inclined to believe that many of the species to be hereafter enumerated are merely varieties of it. I have examined the type and compared a shell from Pegu with it, which will be figured. It agrees very well. Küster's figure represents a variety with unusually prominent umbones, and rather longer from the hinge to the ventral margin than usual.

U. marginalis is by no means confined to India. It abounds, as I have already mentioned, in Pegu. One of Lamarck's forms came from Ceylon, and Küster appears much disposed to unite to it a species from the Nile in Egypt. Lamarck's type was said to inhabit rice-fields in Bengal.

No. 4.—UNIO ANODONTINUS, Lam. Bengal.

U. anodonta, Lam. VI. 80, No. 47.

U. anodontinus, Küster, Mart. and Chemn. p. 240, Pl. 80, f. 5.

Lea has classed this shell as identical with *U. marginalis*, Lam. If Küster's figures in the Conchylien Cabinet can be trusted, the two shells differ more than any one of Lea's three species, *bilineatus*, *lamellatus*, and *Bengalensis* do from each other, or from *marginalis*. Most of the Bengal specimens of *marginalis*, however, are intermediate between the two forms figured by Küster as *marginalis* and *anodontinus*.

The locality given by Lamarck for this species is Virginia. I unfortunately omitted to examine the specimen when I had the opportunity of doing so. There is, I believe, no question but that the shell was really from India.

No. 5.—UNIO FAVIDENS, Bens. Ganges valley and Burhampooter valley, Assam.

Benson, Gleanings in Science, I, Pl. 8, f. 1.

„ Ann. Mag. Nat. Hist. 1862, 3rd Ser. X. 188.

This species has been frequently confounded with *U. corrugatus*,



Lam. It differs totally from all the shells referred to that species, and all its numerous varieties are easily distinguished both from Lamarck's and Chemnitz's types of *corrugatus*. *U. favidens* is more inequilateral, it is a thicker shell with much stronger and broader cardinal teeth. The type, too, is more angulate, both anteriorly and posteriorly. The following varieties of *U. favidens*, with their localities, are described by Mr. Benson in the Ann. and Mag. Nat. Hist. Vol. X, pp. 188, 189.

Unio favidens, type. Bhitoura on the Ganges between Cawnpore and Allahabad.

- 1 *var. marcens*, Burhampooter river, Assam.
- 2 „ *trigona*, Nujeebabad in the north-west of Rohilkund.
- 3 „ *Deltæ*, Jellinghy river, Bengal.
- 4 „ *Chrysis*, Dojora river, Kareily Ghat near Bareilly.
- 5 „ *viridula*, "Jheel" between Humeerpore and Someerpore, Bundelkund.
- 6 „ *densa*, Ganges river above Chunar.

No. 6.—*UNIO CÆRULEUS*, Lea.—Hoogly river, 100 miles above Calcutta.

Lea, Trans. Am. Phil. Soc. IV, 95, Pl. 13, f. 25.

Benson, J. A. S. B. IV. 450.

Küster, Mart. and Chem. p. 228, Pl. 77, fig. 4.

The two figures agree perfectly. The type is a very thin shell, with fine lamellar teeth. Specimens exist in the Asiatic Society's Museum, brought from Bhagulpore. The form is widely distributed in N. India; I have even a variety from Sind.

No. 7.—*UNIO BILINEATUS*, Lea. Hoogly river with the last.

Symphonota bilineata, Lea, Trans. Am. Phil. Soc., IV. 98, pl. 11, f. 19.

Benson, J. A. S. B. IV. 452.

Benson, (Ann. Mag. Nat. Hist. Ser. 3, Vol. X., pp. 187, 195) shews that this is merely the very young form of *U. marginalis*, Lam. He is unquestionably correct. The "two delicate lines passing from the beaks to the posterior region" are, like many other umbonal markings, characteristic of young shells, and disappear gradually with age. The remains of them, much blunted, are often to be detected on adults.

No. 8.—*UNIO OLIVARIUS*, Lea. Ganges valley.

Lea, Trans. Ann. Phil. Soc. IV, 108, pl. 16, f. 38.

Benson, J. A. S. B. IV. 453.

Küster, Mart. and Chem., p. 244, pl. 82, f. 2.

The locality given by Lea is Burrill river, India. Küster, who appears to be indebted for all his Indian species described by Lea to Dr. von dem Busch, gives Burrill river, Indiana (!), North America, as the locality. Mr. Benson says—"It is widely distributed in the Gangetic region, and is most abundant in the Rohilkund streams." The variety figured by Küster differs from Lea's type is being more inequilateral, much shorter anteriorly, and more obtuse posteriorly, and of a light green colour instead of pale olive. Indeed, it is by no means clear that the specimen figured is not a variety of *U. cæruleus*. I do not know if there be such a river as the Burrill, but the locality for the original type is very probably the neighbourhood of the Burail Range, north of Cachar, as the shell was received by Lea from a Dr. Burrough who collected extensively in Assam, and who supplied the original specimens, from which *Hylobates Hoolock* was described, to Dr. Harland.* This is not far from the localities whence the closely allied *U. Nuttallianus*, Lea, and *U. involutus*, Benson, were obtained.

No. 9.—*UNIO CORRIANUS*, Lea. Calcutta.

Lea, Trans. Am. Phil. Soc. V. 65, pl. 9, fig. 25.

Küster, Mart. and Chem., p. 229, pl. 77, fig. 5.

Two completely distinct shells are figured by the two authorities above referred to. Lea's original type is a young form of one of the common varieties of *marginalis*, approaching *U. anodontina* of Lamarck; Küster's, on the contrary, is a form allied to *U. cæruleus*, but thicker, and with broader hinge teeth than that species, so that it is more diverse from *U. marginalis* than even *cæruleus* is! Küster's specimen was derived from Dr. von dem Busch, who, in this and other instances, appears to have utterly confounded different forms.

* See Transactions of the American Philosophical Society, Vol. IV. p 52. It is a disgrace to the science of England as represented in British India, and a lasting memorial of the disregard of natural history which has always been a characteristic of the British Government of India, that so remarkable an animal as the Hoolock should have been first recognised by an American naturalist at so late a date as 1834. Had India belonged to France, the United States or Russia, the study of its fauna would not have been left to the unaided efforts of private individuals.

No. 10.—*UNIO BENGALENSIS*, Lea. Bengal.

Lea, Trans. Am. Phil. Soc. VI. 3, pl. 2, f. 3.

Küster, Mart. and Chem., p. 228, pl. 77, f. 2, 3.

In this case again, two totally distinct shells are figured, and again the authority for Küster's appears to be Dr. von dem Busch, whose collection furnished the specimen figured in Martini and Chemnitz. Lea's type is a very peculiar variety of *U. marginalis*, very much "longer" (that is wider when measured from the umbones to the ventral margin) in proportion to the breadth than usual. I have not met with it. It was obtained by Lea from Dr. Burrough who purchased it in Calcutta, and believed that it inhabited the Ganges. It has better claims to distinction than most of Lea's "species."*

Küster's type is a much thicker, more tumid shell, with far stronger teeth and impressed cicatrices, much more inequivalve and different in almost every character. I cannot recognise it as any form with which I am acquainted, and I much doubt its being Indian at all. At all events it is nearer to *U. corrugatus* than to *U. marginalis*.

No. 11.—*UNIO LAMELLATUS*, Lea. Bengal.

Lea, Trans. Am. Phil. Soc. VI. 19, pl. 6, f. 16.

This is another variety of the *U. marginalis* type, perfectly intermediate between the two last named, and approaching the type more nearly than either. Lea's shells were probably immature. In the younger shells of *marginalis*, the hinge teeth are more lamellar than in the adults, and the principal character of this "species" and of the two preceding is the lamellar teeth.

I have not met with the exact type of this shell, but it doubtless inhabits the neighbourhood of Calcutta. Specimens resembling it in every way except in being rather less long (in the dorso-ventral diameter) in proportion to their breadth are common.

No. 12.—*UNIO RAJAHENSIS*, Lea. Rajah's Tank, Calcutta.

Lea, Trans. Am. Phil. Soc. VIII., 239, pl. 23, fig. 53.

The above is the locality quoted. I am unable to discover what

* In a letter to my brother, Mr. Benson suggested a doubt as to whether this species were Indian. Taking into consideration the circumstance that nearly all the shells in the Calcutta bazar are foreign, this suggestion appears highly probable.

tank is referred to. The shells inhabiting the Seven Tanks shew a considerable difference. The shell is a small, subrotundate, thick form, approaching some of the varieties of *U. favidens*, Bens., and has much the appearance of being stunted and distorted, a very common occurrence in tanks, and especially in those of Calcutta, probably in consequence of their being slightly brackish at times. Two specimens, agreeing well with Lea's figures, exist in the Asiatic Society's Museum. A very similar shell inhabits the Nerbudda.

No. 13.—*UNIO SHURTLEFFIANUS*, Lea. Sina River, India.

Lea, Jour. Acad. Nat. Sci. Phil. III., 302, pl. 27, f. 17.

The Sina river runs past Ahmednugger in the Deccan. It is an affluent of the Bheema, one of the principal feeders of the Kistna. This shell has somewhat the form of *Unio cæruleus*, but is thicker. Unfortunately the volume containing the description of this shell does not appear to exist in Calcutta, so I cannot tell whether specimens, which I possess from the neighbourhood, belong to the type form or not. In such extremely variable shells as *Unio* this is a matter of considerable importance.

No. 14.—*UNIO MERODABENSIS* v. d. Busch, Province of Merodab in Bengal. (!)

v. d. Busch. MS. in Küster, Mart. and Chem., p. 233, pl. 78, fig. 4.

I give the locality of this ridiculously named species as it is quoted in Küster. The locality is doubtless Moradabad in Rohilcund. Küster gives as a synonym ? *U. flavus*, Benson, and adds the remark: "Whether this species be Benson's described *U. flavus*, I cannot ascertain, as I have not access to Benson's work. The name would be ill-selected, as the shell is by no means yellow."

Of course Benson's species thus referred to is *U. favidens*, of which the present appears to be a variety, very close to Mr. Benson's *var. trigona*. The name *Merodabensis* is so utter a barbarism, that it will be satisfactory to be rid of it. For the little series of blunders attending the description of this type, Dr. v. d. Busch again appears to be responsible.

No. 15.—*UNIO SIKKIMENSIS*, Lea. Sikkim.

Lea, Jour. Acad. Nat. Sci. Phil. 2nd Ser. IV. 251, pl. 39, f. 131.

I have some doubt about the locality assigned to this species. It



approaches the S. Indian forms of the *corrugatus* type (Lamarck's) in outline, and is barely distinguishable from two shells in the Asiatic Society's collection, which are labelled from Ceylon. It is a stouter shell than the Lamarckian *corrugatus*.*

No. 16.—*UNIO NAGPOORENSIS*, Lea. Ambajiri tank, Nagpoor.

Lea, Jour. Acad. Nat. Sci. Phil. Ser. 2, IV. 270, pl. 45, f. 150.

This species is barely separable from some varieties of *Unio favidens*, Bs. It is, however, a rounder, thinner shell, forming a link, both in character and locality, between that species and *Unio corrugatus*.

No. 17.—*UNIO WYNEGUNGAENSIS*, Lea. Wynegunga river, east of Nagpoor.

Lea, Jour. Acad. Nat. Sci. Phil. 2nd Ser. IV, 271, pl. 45, f. 151.

Except in greater thickness, and stouter hinge teeth, there appears no distinction of the slightest importance between this "species" and the last. The type abounds in the Godavery and its feeders, and is, as usual, variable. The locality given by Lea is Wynegunga river, East of Nagpoor in the Deccan, Bengal, which is equivalent to talking of Philadelphia in New England, Virginia. However it is hardly fair to expect American naturalists to have accurate information on Indian geography, when an English naturalist of repute confounds the Khasi hills in N. E. India with the Nilgiris in the S. W., and when a second, in a work solely devoted to Indian zoology, perhaps the most important work on any branch of Indian Natural History, exclusive of botany, ever published in England, confounds Saharunpoor with Serampoor on the Hooghly. After this, the discovery made by the *Times* newspaper, a few years ago, that a spur of the Himalayas is visible from Calcutta is not so surprising. A distinguished French naturalist, five or six years since, placed Kattiawar in Cochin China, but it is only fair to add that this was before the French expedition to the latter country, and that French naturalists have already done not a little towards making us better acquainted with the Molluscan fauna of that little known region.

* Since writing the above, I have learned that the locality is correct. The shell was collected by Dr. Bacon.

No. 18.—*UNIO THECA*., Bens. River Cane near Banda, Bundelcund.
Benson, Ann. and Mag. Nat. Hist. 1862, 3rd Ser. X. 186.

I have not seen this form. It belongs, according to Mr. Benson, to the *Corrianus* type of *Unio marginalis*.

No. 19.—*UNIO MACILENTUS*, Bens. Choia Nuddy, near Bijnore, Rohilcund.

Benson, Ann. and Mag. Nat. Hist. 1862, 3rd Ser. X. 187.

A rather thin species resembling *cæruleus*, but with stout hinge teeth, resembling those of *U. favidens*. I am unacquainted with the type, but a very similar form is common in the Damuda and its tributaries in Bengal.

No. 20.—*UNIO TRIEMBOLUS*, Bens. R. Ramgunga, near Moradabad.
Benson, Ann. and Mag. Nat. Hist. 1862, 3rd Ser. X. 190.

A thick shell with large hinge teeth. A massive species which inhabits the Nerbudda, and the shells of which are found fossil associated with the bones of extinct mammalia in the gravels of the river valley, may be a variety of this species. I have never seen the type.

No. 21.—*UNIO PLAGIOSOMA*, Bens. River Cane near Banda, Bundelcund.

Benson, Ann. and Mag. Nat. Hist. 1862, 3rd Ser. X. 191.

No. 22.—*UNIO LÆVIROSTRIS*, Bens. Near Chunar, in streams and tanks.

Benson, Ann. and Mag. Nat. Hist. 1862, 3rd Ser. X. 191.

No. 23.—*UNIO PINAX*, Bens. Gungun stream, near Moradabad, Rohilcund.

Benson, Ann. and Mag. Nat. Hist. 1862, 3rd Ser. X. 192.

The three abovenamed species appear all to be allies of *U. favidens*. They probably pass into each other.

No. 24.—*UNIO LEIOMA*, Bens. Deccan? near Bombay.

Benson, Ann. and Mag. Nat. Hist. 1862, 3rd Ser. X. 192.

The locality of this shell is uncertain. I have no species from Western India which agrees with the description.



No. 25.—*UNIO OCCATUS*, Lea. Bengal.

Lea, Jour. Acad. Nat. Sci. Phil. 2nd Ser. V. 398, Pl. 50, fig. 304.

A compressed form, with strong teeth, fairly intermediate between *cæruleus* and *favidens*, and allied to *U. macilentus*, Bs. and *U. plagiosoma*, Bs. but more compressed than either. It especially requires comparison with *U. macilentus*, of which it may be a compressed form.

No. 26.—*UNIO GERBIDONI*, Eydoux. Coromandel.

Said by Lea to be the same as *Unio cæruleus*.

No. 27.—*UNIO BONNEAUDI*, Eyd. South India.

No. 28.—*UNIO GAUDICHAUDI*, Eyd. Bengal.

No. 29.—*UNIO KERAUDRENI*, Eyd. Chandernagore.

I am indebted for all my information as to the above four species to Mr. Benson. I have not access at present to the work in which they are described.

In Küster's monograph of *Unio* in Martini and Chemnitz another species is described from the "East Indies," *U. Exanthematicus*, Küster, p. 243, pl. 81, fig. 2. The authority, however, for the locality is Dr. v. d. Busch, whose general accuracy, after the instances given above, may be open to doubt; the "East Indies" in a Natural History sense, not many years since, denoted any country between Africa and Kamschatka, and the peculiar pustulated surface of the shell, from which the name is derived, is unknown in any Indian species. I think it is probably not a native of the Indian Peninsula.

U. discus, Lea, Trans. Am. Phil. Soc. IV, 74, Pl. 18, f. 57, was at first stated to be from India, on, however, palpably insufficient grounds, the original specimen having been purchased from a dealer amongst a lot of shells from India. The shell is so distinct from any known Indian species, that I had concluded that the locality was assigned to it in error, before I found that in a subsequent volume of the Trans. Am. Phil. Soc., Vol. VIII., p. 234, note, Lea mentions his having ascertained that the locality was the River Moctezuma in Central America.

Mr. Benson mentions (Ann. and Mag. Nat. Hist. 1862, X., 195,) his having received from the Malabar Coast a shell which he refers to *U. consobrinus*, Lea.



Unio spuria is said by Lamarck to be from Southern Asia. Mr. Benson states (Ann. and Mag. Nat. Hist. 1862, X., 189,) that the young of *U. favidens* approaches the figure given by Wood of *Mya spuria*, which is, I suppose, the same species. It is not clear that Lamarck's type was Indian. Mr. Benson also (l. c. p. 189) refers to *Mya radiata*, Chem. as being from Malabar. *Mya radiata*, Gmelin is by Lamarck, Lea and Küster, said to be American, and even in Küster I can find no allusion to Chemnitz's species.

It is only right to add too that some of what Woodward most justly terms "the worthless fabrications of Rafinesque" (Man. Mol. p. 136, noté,) came from India. No scientific purpose can be served by recalling the names from the oblivion in which they are happily buried.

H.—ASSAM.

No. 30.—*UNIO INVOLUTUS*, Benson, Assam.

S. Hanley, Supp. to Wood's Ind. Test.

I only know of this and the succeeding three species from reference being made to them by Mr. Benson in the Ann. and Mag. Nat. Hist. for 1862, 3rd Ser. X., 186. The work in which they were originally described is not procurable in Calcutta. *U. involutus* is said to be thin and tumid and to represent *U. olivarius*, Lea, in Assam.

No. 31.—*UNIO CORBIS*, Bens. Assam.

S. Hanley, Supp. to Wood's Ind. Test.

No. 32.—*UNIO RADULA*, Bens. Assam.

S. Hanley, Supp. to Wood's Ind. Test.

No. 33.—*UNIO SCOBINA*, Bens.

S. Hanley, Supp. to Wood's Ind. Test.

U. fluctiger, Lea (teste Benson) Jour. Acad. Nat. Sci. Phil. 2nd Ser. IV. 250, pl. 39, f. 130.

„ Küster, Mart. and Chem., p. 237, pl. 80, fig. 1.

Mr. Benson (in Ann. and Mag. Nat. Hist. 1862, X., 186) states that *U. fluctiger*, Lea, is a synonym of *U. Scobina*. Küster's figure of *fluctiger* differs from Lea's type, and the shell is stated to be from S. America. As, however, Küster's specimen was from Dr. v. d. Busch's cabinet, very little reliance can be placed upon the assigned locality, especially as Lea, who did not know whence the shell came, suggested that it was, possibly, South American.

Küster's type is narrower anteriorly and has rather different, coarser plication posteriorly, than Lea's. It may be a different shell.

No. 34.—*UNIO NUTTALLIANUS*, Lea. Assam, teste Benson.

Lea, Jour. Acad. Nat. Sci. Phil. III., 310, pl. 30, f. 25.

The locality is simply stated to be India by Lea. Benson, Ann. and Mag. Nat. Hist. 1862, X., 194, states that he has received specimens from Assam. The volume containing the description of this shell is not procurable in Calcutta.

No. 35.—*UNIO JENKINSIANUS*, Bens. Burhampooter River, Assam. Benson, Ann. and Mag. Nat. Hist. 1862, 3rd Ser. X., 185.

An ally of *U. marginalis*, distinguished by "the very tumid form, the sloping posterior end, absence of a wing, the short ligament, and the nature and position of the teeth." (Bens. l. c.) In the Asiatic Society's collection there is a shell from Bhagulpoor perhaps referable as a variety to this species.

No. 36.—*UNIO PACHYSOMA*, Bens. Burhampooter River, Assam.

Benson, Ann. and Mag. Nat. Hist. 1862, 3rd Ser. X., 186.

"An inflated form of the *cæruleus* type." (Bens. l. c.) Mr. Benson also states that he has received a distorted variety from Calcutta. A peculiar tumid form which is not uncommon in Calcutta tanks is doubtless referred to. It agrees generally with the description given. This form therefore adds one more to the Bengal list.

No. 37.—*UNIO SMARAGDITES*, Bens. Burhampooter River, Assam. Benson, Ann. and Mag. Nat. Hist. 1862, 3rd Ser. X., 190.

A shell allied to *U. favidens*.

Besides these forms a variety of *U. favidens*, Bens. (*var. marcens*) has already been quoted as occurring in Assam. Mr. Benson also records the receipt of a variety of *U. cæruleus* (J. A. S. B. VI. 750) and of a small variety of *U. marginalis* (Ann. and Mag. Nat. Hist. 3rd Ser. X. 186) from that region.

III.—CEYLON.

No. 38.—*UNIO LAYARDI*, Lea. Ceylon.

Lea, Jour. Acad. Nat. Sci. Phil. 2nd Ser. IV., 243, pl. 36, f. 122.

This is a shell of the *marginalis* type with a convex dorsal margin, and generally rounded outline. It appears to be a fairly distinguishable form, though very close to *Bengalensis* and *lamellatus*.

No. 39.—*UNIO THWAITESII*, Lea. Ceylon.

Lea, Jour. Acad. Nat. Sci. Phil. 2nd Ser. IV., 246, pl. 37, f. 125.

This shell only differs from the last in having a rather straighter hinge line, and being slightly more inequilateral. If such differences are to rank as specific, half a dozen "species" might be manufactured out of any tank in Calcutta. The separation of these two forms is perfectly unjustifiable in a genus like *Unio*.

The above are the only species that I can trace specially described from Ceylon. Lamarek's variety *b.* of *Unio marginalis* described as *var. testâ minore, brevior*, and 75 millimetres broad was also from Ceylon (Lam. VI. 79). Sir Emerson Tennent, in his work on Ceylon, enumerates only *U. corrugatus* besides *U. marginalis*. He, however, adds that Mr. Cuming possessed six species from the island, which had been sent to Mr. Lea. *U. Thwaitesii* and *U. Layardi* are doubtless two of these, as they were from Mr. Cuming's cabinet, but no mention is made of the others by Mr. Lea.

IV.—BURMA.

No. 40.—*UNIO TAVOYENSIS*, Gould. Tavoy.

Gould, Proc. Bost. Soc. Nat. Hist. I., 140.

„ Ot. Conch. p. 190.

Küster, Mart. and Chem., p. 166, pl. 48, f. 2.

"Closely allied to *U. corrugata*, Lam. which is less rounded and less corrugated" (Gould, l. c.) More nearly allied to Lamarek's than to Chemnitz's type of *U. corrugatus*. Küster's figure agrees well with Gould's description, but represents a young shell, not mature. The specimen figured was from the collection of Dr. Sturm (and not from that of Dr. v. d. Busch).

No. 41.—*UNIO CRISPATUS*, Gould. Tavoy.

U. crispata, Gould, Proc. Bost. Soc. Nat. Hist. I., 141.

„ Ot. Conch. p. 191.

No. 42.—*UNIO FOLIACEUS*, Gould. Tavoy.

U. foliacea, Gould, Proc. Bost. Soc. Nat. Hist. I., 141.

„ Ot. Conch. p. 191.

An ally (variety?) of *U. marginalis*, Lam. "Closely allied to *U. Bengalensis* and *Corrianus*, Lea." (Gould, l. c.)



No. 43.—*UNIO EXOLESCENS*, Gould. Tavoy.

Gould, Proc. Bost. Soc. Nat. Hist. I., 141.

„ Ot. Conch. p. 191.

Apparently, from the description, another ally or variety of the *U. marginalis* type.

No. 44.—*UNIO GENEROSUS*, Gould. Tavoy.

Gould, Proc. Bost. Soc. Nat. Hist. II., 220.

„ Ot. Conch. p. 201.

I believe I possess this species. Specimens were sent to me by Mr. Theobald from Pegu, which agree with the description fairly, except that they are smaller than the type.

No. 45.—*UNIO LUTEUS*, Lea. Newville, Tavoy.

Lea, Jour. Acad. Nat. Sci. Phil. III., 302, pl. 27, 17.

I have not access to the description or figure of this species.

No. 46.—*UNIO CRISPISULCATUS*, Bens. Bangong R. near Thayet Myo, Pegu.

Benson, Ann. and Mag. Nat. Hist., 1862, 3rd Ser. X., 193.

I am indebted to Mr. Theobald for specimens of this shell. It appears doubtful whether it be more than a variety of *U. crispatus*, Gould, to which Mr. Benson does not refer in his description; and with which he was possibly unacquainted. Gould's description is very brief, and gives the idea of a more coarsely sculptured shell (*“ rugis angulatis radiantibus undique crispata ”*) besides being somewhat shorter (from the dorsal to the ventral margin) in proportion to its breadth, but these are not necessarily specific distinctions.

No. 47.—*UNIO PUGIO*, Bens. Ava and Pegu.

Benson, Ann. and Mag. Nat. Hist., 1862, 3rd Ser. X., 193.

A solitary valve was sent to Mr. Benson by Mr. Theobald, who gave the locality as Ava. I subsequently found the same form in the Myanounng district of Pegu, and Mr. Theobald has since obtained larger varieties, I believe from Prome. It is a well marked type, extremely inequilateral, and with a peculiar acuminate form posteriorly.

As already observed, the type form of *Unio marginalis*, Lam. abounds in Pegu. I found unusually fine specimens in large swamps about Henzada and Myanounng in the Irawady valley. The type gradually passes by insensible gradations into a much less transverse



form, almost subquadrate. The posterior portions of the valves were often covered by the remarkable fresh water Bryozoon *Hislopia* of Carter, apparently a new species.

I have other species from Pegu, but I am unable at present to compare them with the numerous named forms described by Lea from Siam, many of which probably extend to Burma.

Genus ANODONTA, Brugiere.

No. 1.—ANODONTA SOLENIFORMIS, Bens. Assam.

Benson, J. A. S. B. V., 750.

The type specimen is in the Asiatic Society's Museum (now the Imperial Museum). There is also an *A. soleniformis*, D'Orbigny, but Mr. Benson's name is the oldest, as it was published in 1836.

Mr. Lea has described a species from Siam, evidently very closely allied to this, as *Mycetopus emarginatus*, Lea. (Jour. Acad. Nat. Sci. Phil. 2nd Ser. V., 398, pl. 50, f. 305). As the animal has not been observed, it may be doubtful if it is really a *Mycetopus*. At the same time the character of both the Siam and Assam shells are so distinct from those of any true Anodonta, that perhaps the best provisional classification is that adopted by Mr. Lea. Specimens of *A. soleniformis* with the animal living are a peculiar desideratum.

No. 2.—ANODONTA SALWENIANA, Gould. Salween R., Burma.

Gould, Proc. Bost. Soc. Nat. Hist. I., 158.

„ Ot. Conch. p. 193.

A very peculiar broad shell, belonging to *Monocondylæa*. (See next species.) I have never seen this form.

No. 3.—ANODONTA INOSULARIS, Gould. Salween R., Burma.

Gould, Proc. Bost. Soc. Nat. Hist. I. 158.

„ Ot. Conch. p. 193.

Subsequently in the same volume, p. 161, Dr. Gould suggested that this species might be the type of a new genus which he named *Pseudodon*. This name is by Adams quoted as a synonym of *Anodonta*, but the type species is not quoted under that genus, nor, so far as I can detect, under any other. In *Ot. Conchologica*, Gould, in describing the genus, adds in brackets "perhaps equivalent to *Monocondylæa*, D'Orb." So far as the shell is concerned, this is undoubtedly the



correct position of these species, if the hinge teeth are trustworthy indicators of generic affinity. H. and A. Adams, in the Gen. Rec. Moll., include under *Monocondylæa*, *M. Vondenbuschiana*, Lea, from Java,* described by Lea as a *Margaritana* (*Baphia* of Adams) and several species of the genus have been described from Siam and Cochin China by French and American naturalists.

I have received from Mr. Theobald fine specimens obtained in Pegu which correspond admirably with *Margaritana Vondenbuschiana*, Lea, and unquestionably belong, I think, to that species; and also shells which appear to belong to a variety of *Anodonta inoscularis*, agreeing with the type in size, shape and every character of importance; and not only are the two forms unmistakably congeneric, but I even think it probable that specimens might be met with to unite them specifically, as they differ in no essential character, except the very different degree of development of the cardinal tooth, which in *Vondenbuschiana* is scarcely raised, while in the specimens which I refer to *inoscularis* it is sometimes nearly a quarter of an inch high.

There are in the Asiatic Society's collection, also, two forms which appear to me certainly varieties of *M. Vondenbuschiana*. One of them, however, agrees more closely with the figure of *M. Cumingii*, Lea (Jour. Acad. Nat. Sci. Phil. 2nd Ser. IV, 235, pl. 33, f. 114) a Malacca shell, which only differs from *Vondenbuschiana* in unimportant minutiae.

M. Vondenbuschiana is described and figured by Lea in Trans. Am. Phil. Soc. VIII, 222, pl. 18, f. 39, and also in Küster.

Were there nothing but the form of the hinge teeth to connect the South American species of *Monocondylæa* with the Burmese and Javanese *Pseudodon* and *Margaritana*, especially having regard to the very diverse form of the shell, I should suspect them to be in reality distinct types. But there is one little peculiarity which appears to tend to unite them. At the termination of the portion of the hinge line in which, by close inspection, flattened obsolete representations of the lateral teeth may be seen, there is a very peculiar expansion of the end of the ligament which covers a small sinus in the inner surface of both valves. This is very well shewn in Lea's figure of *Margaritana*

* Yet they state, "All the species of this genus known are from the rivers of South America."



Vondenbuschiana, and also in both Adams's figures of different species of *Monocondylæa* from S. America. The same occurs in *Anodon* and in the type species of *Margaritana* of Schumacher,* (*M. margaritifera*, L.). I have not had an opportunity of examining the animals of the Burmese species of *Monocondylæa*, and therefore cannot say if the gills are free or not.

Besides the above forms, a minute species of *Anodon* is stated by Mr. Benson to inhabit ponds in Bundelcund, J. A. S. B., V. 750.

P. S. No. 2a.—*UNIO SPURIUS*, Gm. Tranquebar.

Mya spuria, Gm. vol. I, Pt. VI, p. 3222, No. 16.

Unio spuria, Lam. VI, 80, No. 45.

Mya spuria, Wood, Ind. Test. p. 12, pl. 2, No. 35.

Since writing the note on this species at p. 146, I have found that it was described originally as from India. Gmelin refers to Schroeter Einl. in Conch. II, 617, No. 9, pl. 7, f. 5, so perhaps the name may have been given by Schroeter, though that by no means follows from the reference. The description is very brief: "*M. testâ rhombicâ viridi, natibus glabris*" and the shell is said to be like *corrugatus*, but nearly twice the size and perfectly smooth in front of the beaks ("*praeter vulvæ regionem tota glabra*," Gm. l. c.). Wood's figures are all poor. The shell can scarcely be a young form I think, if considerably larger than *corrugatus*.

Mya radiata,† I find, is attributed to Malabar by Gmelin, (p. 3220,) from whom Wood appears to have only copied his localities. The species is, I think, correctly attributed to Chemnitz by Mr. Benson, although other authors give Gmelin as their authority. Gmelin's description runs thus—" *M. testa æquivalvi pellucida tenuissime transversim striata viridi flavicante livido radiata; valvis altero latere latissimis, altero angustissimis*." I know of no form of Indian *Unio* to which this description would be applicable, and I cannot help suspecting that the writers who have applied the name to an American species may very possibly be right. Wood's figure, also, does not recall any Indian

* It is by no means clear that *Margaritana* and *Monocondylæa* are more than subgenera, or even artificial sections of *Anodonta*. *M. Vondenbuschiana* is intermediate between the second and last in characters of the shell, and there is no known essential distinction in the animal.

† The Linnæan genus *Mya*, like most Linnæan genera, was an artificial group to some extent. Besides *Mya* as now understood, it comprised *Unio* and several other genera.



species; for it is evident from the above description that the radiating lines shewn do not refer to striæ but to coloured markings. Mr. Benson's shell from Malabar was striated.

Good collections of the *Unios* of both Coromandel and Malabar are greatly needed to determine all these doubtful species.

MONOCONDYLÆA CREBRISTRIATA, Anthony. Pegu.

American Journal of Conchology, I., 205, pl. 18.

MONOCONDYLÆA PEGUENSIS, Anthony. Pegu.

Am. Jour. Conch. I., 205, pl. 18.

I am indebted to Mr. Theobald for the above quotations. The shells are the two *Monocondylæa* above referred to, the first being that referred by me, though with some doubt, to *Anodonta* (*Pseudodon*) *inoscularis*, Gould, the second to *Monocondylæa Vondenbuschiana*, Lea. So long as it is the practice of naturalists living in foreign countries, and, necessarily, imperfectly acquainted with the fauna of distant regions, to give a "specific" name to every animal or fragment of an animal which reaches them, lists of synonyms must multiply; and as everybody will contend for the distinctness of his "species," false notions as to the nature and value of specific distinctions must prevail. Thus, in the same paper, one of the numerous varieties of *Melania variabilis*, Benson, is called *M. gloriosa*, Anthony. Now it is worthy of remark that Mr. Benson, who has examined far more of the Mollusca of Burma than Mr. Anthony can possibly have seen, has not for years described a single *Melania* from that country as new, and has only described two species of *Unio*, although he had specimens of all Mr. Anthony's supposed new species. I can only add that it would be easy for me to describe, from the materials I possess, 20 or 30 forms of *Unio* (and nearly as many more of *Melania*) with as good claims to distinction as one-half at least of those already published from India and Burma; but were I to do so, I cannot help thinking that, while burdening science with additional names, I should have added nothing to the knowledge of the fresh water mollusca of India. Amongst fresh water shells I am convinced that forms pass into each other far more than amongst land shells, that "species," in the usual definition of the word, have no existence, that all the characters relied upon for distinguishing "species" of *Unionidæ* in especial, the form and thickness of the hinge teeth, form



of the shell, prominence of the umbones, shape of the muscular impressions, colour of the nacre, characters of the epidermis, &c. vary *ad infinitum*—in short that species must be described like genera and grouped around types, not distinguished by characters.

I see from a notice in the *Paris Journal de Conchyliologie* that, in the same volume of the *American Journal of Conchology*, Mr. Conrad proposed a new genus *Trigonodon* for *Monocondylæa crebristriata* of Anthony, from which, as I have stated above, *Anodonta inoscularis*, Gould, is at the best but dubiously separable specifically. But the last named shell is the type of Gould's genus *Pseudodon*, and Gould himself suggested the identity of that genus with D'Orbigny's *Monocondylæa*.* Unless Mr. Conrad has procured the animals of the Pegu forms, and shewn them to be distinct from those of South America, (and I scarcely think he can have done so,) I cannot believe that any useful object is attained by inventing these generic appellations. Even if *Trigonodon* be not *Pseudodon* over again, (Mr. Conrad appears to have already furnished one synonym before for *Pseudodon*, viz. *Monodontina*,) there has been no distinction of any generic value shewn between the shells of Burmese and Malay species of *Monocondylæa* and those of S. America; and bearing in mind that there are some genera of more restricted distribution than those belonging to the *Unionidæ*, e. g. the Tapir, and amongst Mollusks, *Cyclophorus* and *Megalomastoma*, common to the two regions, it would, I think, be more scientific to examine the animals of the Burmese shells allied to *Monocondylæa*, before founding new genera to comprise them.

There is of course the possibility that Mr. Theobald may have been misinformed as to the respective names of the two species, and that the type of *Trigonodon* is the form I have referred to *Monocondylæa Vondenbuschiana*. I can only add that the specimens of the same shell from the same locality sent to me by Mr. Theobald, do not differ more from Küster's figure of V. d. Busch's original specimen of *M. Vondenbuschiana* in Martini and Chemnitz, than that figure does from Lea's.

UNIO PEGUENSIS, Anthony. !

American Journal of Conchology, Vol. I.

I cannot learn what species has been thus named. I hope to be able to refer to the volume before long and to return to the subject.

* *Ot. Conch.*, p. 194.

Two Indian species of *Unio* in the Musée d' Histoire Naturelle at Paris have received MS. names from Valenciennes. I am unable to ascertain at present if these names have been published or not.

Corrigenda in Contributions to Indian Malacology, No. VI., in this volume :

P. 31,	line	2,	from bottom,	for	Kimery	read	Kimety.
32,	"	7,	" top,	"	<i>Fordoni</i>	"	<i>Gordoni</i> .
"	"	8,	" bottom,	"	Hattiwar	"	Kattiawar.
34,	"	2,	" "	"	inwardly	"	conoidly.
35,	"	15,	" top,	"	<i>subgesta</i>	"	<i>subjecta</i> .
37,	"	12,	" bottom,		supply "it"	after	nulla.
"	"	9,	" "		omit the word South.		
38,	"	10,	" top,	"	oblong ovate, Achatina	read	oblong ovate Achatine.
"	"	17,	" "	"	<i>Basilens</i>	"	<i>Basileus</i> .
"	"	12,	" bottom,	"	<i>Alycaeus</i>	"	<i>Alycaeus</i> .
"	"	8,	" "	"	Recluz	"	Recluz.
39,	lines	21, 16 & 11,	from bottom,	for	<i>Basilens</i>	"	<i>Basileus</i> .
"	line	17,	from bottom,	for	Wynand	"	Wynand.
"	"	14,	" "	"	Paulghat cherry	"	Paulghatcherry
"	"	5,	" "	"	of that <i>N. auris</i>	"	of <i>N. auris</i> .
"	"	2,	" "	"	base by	"	barely.
41,	"	11,	" top,	"	slighly	"	slightly.

In the previous number V. of the Contributions, an important error occurs *N. CONULA*, n. s. for *N. CONULUS* (J. A. S. B. XXXIV, 73, 1865).

In the same page, Phoung ditto, Arakan, should be Phoung Do, and three pages further, p. 76, line 12, a semicolon is omitted, altering the sense. The passage should read "a vertical lamina in front, and a second, slightly oblique, just behind; the first giving out" &c. instead of "just behind the first." The only other erratum of importance is in page 81, line 20, where "re-entering lamellar parietal" should be "re-entering parietal lamella."



SCIENTIFIC INTELLIGENCE.

The following is from Mr. Blyth :—

I have already elucidated* sundry species of *Ægialites* (or Ring Plover) and may now further add that I have since made out the *Charadrius pusillus* of Horsfield to be the same as *Æ. ruficapillus*, Gould, figured in his *Birds of Australia* : Horsfield's specimen being in winter dress, and his name of course standing for the species.

The Indian *Neophron* (281) will have to rank as *N. ginginianus*, Latham. The *Spilornis* of Ceylon and of all S. India is the same as *S. Elgini*, Tytler, and will bear my prior name *Spilogaster* (J. A. S. XXI. 351) being distinct from the Malayan *S. bacha*, with which Professor Schlegel identifies it. *Falco babylonicus* is the *F. peregrinoides* apud G. R. Gray, as suggested in p. 282. The Cat noticed as *Felis macrocelis* in p. 283 seems, after all, to be of a different and smaller race than one received from Asám also in the Zoological Gardens. It has now been more than three years in the garden, and has only a slight fulvous tendency even yet, while the other is much more fulvescent, and is also of heavier build. I think that the larger only has the very elongated canine teeth. Neither seems to be the true *Diardii* (vel *macrocelis*) of Sumatra and Borneo ; and I suspect that the larger and more fulvous animal (which the Society's Museum has from Sikhim) should rank as *F. nebulosa*, C. H. Smith, figured in Griffith's English edition of the *Règne animal*. There is also great variation in the *F. aurata*, Tem. (*murmensis*, Hodgson, and the young *F. Temminckii*, Vigors.) A rufous specimen in the India Museum has strongly developed body-markings, akin in type to those of the *macrocelis* group ; others (alike from Sikhim, Malacca and Sumatra,) are deep rufous without trace of body-markings ; and thirdly, there is the blackish race, which is designated *F. nigrescens*, Hodgson, in the second edition of the British Museum Catalogue of Mr. Hodgson's collections. These Cats would seem, in fact, to be in process of specialization, which is carried on a further stage in the *F. Swinhoei* of Formosa, as compared with the other races akin to *F. Diardii*. Lastly, *F. Charltoni* may be a race not strongly specialized apart from *F. marmorata*.

* Asiatic Society's Journal, vol. XXXIV. p. 280.



The whole of these constitute a group of E. and S. E. Asiatic Cats *per se*, which have not the peculiar clubbed tail of *F. unci*a, with which Dr. Gray associates them. To the species of birds to be expunged from Jerdon's Indian series (p. 282), may be added *Otocoris penicillata*, for which *O. longirostris* of Kashmir, Kooloo, &c., has hitherto been mistaken. *O. penicillata* of W. Asia is smaller, with much longer ear-tufts, and the black of the cheeks is continuous with that of the breast. Have I told you that *Carpophaga cuprea*, Jerdon, is well distinguished from *C. insignis*, Hodgson, having the neck and lower parts much more ashy, while both differ from *C. badia*, (Raffles), of Sumatra? Of *C. pusilla*, nobis, I have seen more specimens from S. India, where perhaps it co-exists with the large *C. aenea*; and both *cuprea* and *pusilla* are very likely to inhabit the mountains of Ceylon. *Grauculus Layardi*, nobis, (*papuensis* apud Sykes,) of S. India and Ceylon, is very distinct from *G. macei* of Bengal, &c., much smaller, with the wings strongly banded underneath. The Malayan *G. javensis* is a miniature of *G. macei*, of the same small size as *G. Layardi*. As many as four races have been confounded under *Pycnonotus jocosus*, (L.) a name which must be retained for that of China, which I have not seen. The Bengal bird will stand as *emeria* of Shaw (*pyrrhotis*, Hodgson). The Tenasserim and Penang race is *monticolus*, M'Clelland. That of S. India will be named by Gould, and it has no white markings on the rectrices. In the Zoological Gardens are apparently two new species of Pheasant. One is a female, of a duplicate race to *nycthemerus*, being of the true silver Pheasant type. The other is a male; very like *lineatus* of Burma; but the markings of the upper parts more resemble those of *nycthemerus*; it has no white along the ridge of the tail, and no white streaks on the flanks. Some think it a hybrid; but, if so, it can only be between *lineatus* and *nycthemerus*. The tail, however, is shaped exactly as in the former, whereas it should be considerably more lengthened, if the bird had *nycthemerus* for one parent; and its legs also should in that case be larger, and shew some trace of the crimson colour of those of *nycthemerus*. I am, therefore, disposed to consider it as a true wild race of Kallij, probably from some more eastern part of the Indo-Chinese peninsula.
